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The Orchadian

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Dedicated to the study and care of
Australasian indigenous orchids

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In general **Group** meetings are concerned with native orchids exclusively.

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THE ORCHADIAN

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Editor: J.J. Betts

Honorary Associate Editors: Dr. N.J. Grundon (Qld) Mr. J. Simmons (South Australia)

EDITORIAL

In this issue, Number 1 of Volume 6, we have settled on a new more efficient format. We have taken heed of advice from readers concerned with the feasibility of temporary and permanent storage, of handling either in libraries or in the home and of the ultimate binding in book form. Our changes in format over the past year have no doubt disturbed our more conservative readers — quite understandably — but Volume 6 will cover the next three years and we can promise there will be no change in size of the *Orchadian* for that time. Its content, of course, will continue to be subject to your influence; so please keep in touch.

In this issue we extend to New Zealand with the first of a series of articles on New Zealand's native orchids by Dorothy Cooper and we feature a review of Andreé Millar's new popular book, *Orchids of Papua New Guinea.* As the reviewer says, this book is a "must" for orchid enthusiasts visiting Papua New Guinea and those who cultivate these orchids. I would add that it is a "must" for all of us — the more especially since it is the first "popular" book on what Rudolf Schlechter found to be the richest orchid country in the world, judged on number of species per unit of land area. We hope this book will be a forerunner of more to come. Readers know that our book reviews are as searching as befits a journal combining both amateur and scientific interests. They will therefore expect this review to be uncompromising in its treatment of taxonomic issues, identification and nomenclature. That the reviewer has been critical of these aspects should be taken as encouragement to the author and the publisher as well as an aid to less experienced readers everywhere. Being the only book in English on its subject-matter, this publication will be referred to and quoted for years to come.

In a recent letter, Andreé Millar expressed the opinion that, because it was written for the people of Papua New Guinea, it would probably not be "the type of book that would interest your members." I must disagree. The works of Schlechter, J.J. Smith, and other botanists who dealt with Papua New Guinea orchids will remain inaccessible to most of us as long as translations from the German and Dutch languages are lacking. We are doing what we can to remedy this as readers know; but time is the enemy.

Looking through the "Newsletters" of the Orchid Society of Papua New Guinea one cannot fail to be impressed by the prodigious, untiring work Andreé Millar has done — and is doing — not only as editor of the Newsletter but also as Director of the National Capital Botanic Gardens at Port Moresby. We are pleased to have both Mrs Millar and the Orchid Society of Papua New Guinea as newly enlisted members of ANOS. We hope that the association will be mutually productive.

Towards the end of July I spent a week in Adelaide getting to know the members of the Native Orchid Society of South Australia. Attendance at the July meeting (in cold wet weather) was, I think, the biggest I have seen at a strictly "native" meeting. Also it was an experience to see a benching of plants where the terrestrial orchids more than doubled the number of epiphytes. Among the bonuses of this trip were visits (organised by Jim Simmons and Roy Hargreaves of NOSSA) to the homes of key orchid people in Adelaide. Everywhere there was warm hospitality and something to learn — whether about growing methods or greenhouse design and automation. At the Adelaide Botanic Gardens Herbarium we met Mr J.Z. Weber, the botanist, for a discussion of his work on the revised "Flora of South Australia, Part 1" recently published. Another great pleasure was to visit Mr Harold Goldsack and talk about his past work and correspondence with Rogers and Rupp. The last day of this interesting week was spent with Les Nesbitt, President of NOSSA and leading terrestrial orchid grower. A reciprocal visit by Les to Sydney was arranged to coincide with the ANOS Annual General Meeting on 2 September. All in all it was a week to remember and one that will bear fruit in future issues of the *Orchadian.*

FEEDBACK AND FOLLOW-UP

- The nine FitzGerald black-and-white drawings went to the highest bidder at $200.
- Orders for ANOS seed flasks far exceeded the supply. The Secretary advises that orders will be filled by ballot. Flasks will not be ready before the end of September. Unsuccessful applicants will be listed for preference in future offers.
- The display of native orchids for the Twentieth International Horticultural Congress in August was a credit to the members of the Sydney and Warringah Groups. Early though it was in the flowering season, our organisers managed to display 20 or more species in flower including an eye-catching *Phaius tancarvilliae* and a number of early *Dendrobium* species. Not quite in flower were the *D. ruppianum* and more than 20 other species; but all plants were impressively presented and drew much attention from Congress registrants between lectures. Lest any exhibitors doubt the worth of such displays I hasten to assure them that on the Wednesday I spent there a number of new members were signed up on the spot — two of them, on the strength of the diminutive, delicate *Lyperanthus suaveolens,* the *Caladenia alba* and the *Pterostylis spp.* What we need now, of course, is an attractive brochure for such occasions — even if the plants themselves are their own best advocates.
- Another aspect of the Congress, on 26 August, was the Orchid Workshop at Hawkesbury Agricultural College. Organised by the Orchid Society of N.S.W. and sponsored by the Australian Orchid Foundation, this was a signal success. Eminent speakers from other States joined with Sydney experts to provide a day of excellent lectures. Alvin Bryant, in particular, issued a much needed challenge to growers to be more scientific in their attitudes to "optimum culture". The day culminated in an evening seminar led by Dr R.A. de Fozzard, plant biologist of New England University, on the subject of clonal reproduction and tissue culture. This stimulating session shed some frightening light on the "witchcraft" attitudes people tend to adopt in their eager rush to be up with the latest ("optimum ?") techniques, equipment, ingredients and so on. We need more critical sessions such as these two if we are to avoid for example, the serious pitfalls that appear likely to result from the indiscriminate or inept exploitation of "cloning" by commercial amateurs.

Some interesting Bulbophyllums from New Guinea Araucaria Forests

by N.H.S. Howcroft

The genus *Araucaria* in New Guinea is comprised of two species. These are *A. cunninghamii* Ait. ex Lamb. and *A. hunsteinii* K.Schum. The former has the greatest geographical distribution, extending from Northern New South Wales, Australia to New Guinea. In New Guinea its range commences near the Saga-Aho river in Papua New Guinea at latitude 10°04'S, longitude 105°15'E, and extends as far as the north western end of the Vogelkop of Irian Jaya near Sausapor, at latitude 0°30'S, longitude 132°05'E. The species occurs at altitudes ranging from 60 to 2,745 metres. (Aubreville, 1965; Havel, 1971; Gray, 1973, Zieck pers. comm. 1975; Howcroft, 1977). The distribution of the latter species appears to be restricted to Papua New Guinea. It has not been recorded for Irian Jaya. *Araucaria hunsteinii* occurs in a few large stands and numerous scattered stands of varying sizes from latitudes 5°11'S to 10°11'S and longitudes 142°74'E to 150°01'E. Its altitudinal range is from 520 to 2,100 metres (Gray 1973).

In general, the *Araucaria* stands are rich in other flora; and orchidaceous plants in most cases are well represented and diverse. Among the orchid genera represented in these stands is the genus *Bulbophyllum* which contains many interesting and beautiful species. Many of these are not well known, and are not often seen in cultivation. An interesting section of this genus encountered in many *Araucaria* stands is the section *Hyalosema* Schltr, of which there are more than six species represented in New Guinea. The species, in most cases, have fairly large flowers with prominent dorsal and lateral sepals, and small sometimes ornate petals.

To date four species of this section have been found in *Araucaria* forests three of which have been identified. These are described

Figure 1. *BULBOPHYLLUM FRITILLARIIFLORUM* J.J. Sm. in Bull.Jardin. Bot.Buit.Ser.2e.111 (1912): 24; Nova Guinea XII, 1 (1913):84, t XXII, 67.

An epiphyte, rhizomes creeping, up to 3mm thick, sometimes partly covered with sheaths which decompose. *Pseudobulbs* narrowly ovoid, distinctly 4 angled, 3-3.5cm tall, diameter 1.5cm, spaced approximately 1.5-2.0cm apart along the rhizome. *Leaf* one per pseudobulb, erect, fleshy, oblong-ovate, up to 13.0cm or more long by 4.0 cm wide, apex bluntly pointed, sometimes slightly bilobed, more or less petiolate at base (Fig. 1A) *Flower stalk* ascending, cylindrical with 5 prominent sheathing bracts, up to 16cm long, arising from the pseudobulbs and rhizomes. *Flowers* solitary, large, more or less erect. *Ovary* ascending, cylindrical, smooth, 4-5.0cm wide (Fig. 1C). *Lateral sepals* joined along basal edge, single sepal more or less falcate and porrect, 6.5cm long by 2.5cm wide (Figs 1A, D). *Petals* small, falcate-lanceolate, up to 1.2cm long by 0.4cm wide, apex terminating in a long thin filament, side of petal covered with small warts (Fig. 1E). *Labellum* hinged to column foot, mobile, convex, about 0.6cm long by 0.4cm wide, ventrally keeled (Figs 1F, G), margins and central upper surface covered with many hairs (Fig. 1G). ti *Column* short, about 0.45cm long by 0.5cm from top to tip of lower lateral lobes that extend from either side of the stigma (Fig. 1H), smooth, with a bilobed extension on either side of the clinandrium (Fig. 1F), column foot curved and broad (Fig. 1F). *Anther cap* about 0.2cm tall and 0.15cm wide, more or less reniform with a distinct keel (Figs. 1I-J). *Pollen* in one solid waxy mass, more or less reniform (Figs. K-L).

Colour Description.

The flower is marbled red brown, with a faint greenish yellow flush in between; the column is yellowish white and covered with maroon blotches; the labellum is dark maroon with the undersides white with maroon blotches and its hairs are red, maroon and white.

Flowering Season.

Not well known, however the specimen illustrated in Figure 1 produced flowers in May and June 1975.

Locality Details of Specimen.

Found on Hoop pine *(Araucaria cunninghamii)* and on understory trees at Pimaga in the Southern Highlands Province at 900 metres altitude, latitude 6°30'S., longitude 143°30'E.. The area has a rainfall of approximately 4,000mm per annum.

Distribution.

This species has been reported for other parts of Papua New Guinea without specific details of locality. It also occurs in Irian Jaya.

Other Details.

Spirit material of Fig. 1, illustration No.13 N.H. (Lae's 1520) has been lodged with the Lae Herbarium under Lae number 64039.

Figure 2. *BULBOPHYLLUM GRANDIFLORUM* Bl. in Rumphia IV, (1848):42-195, f.3; F. Muell.in Desc.Notes Pap.Plants II, (1876):30; Schltr in Orch.Dtsch. Neu Guinea (1911):740. J.J.Sm. in Nova Guinea XIV,3(1929):479; Mckillop in Aust.Orch.Rev. XXV, 3(1960):133-34,pl.124.

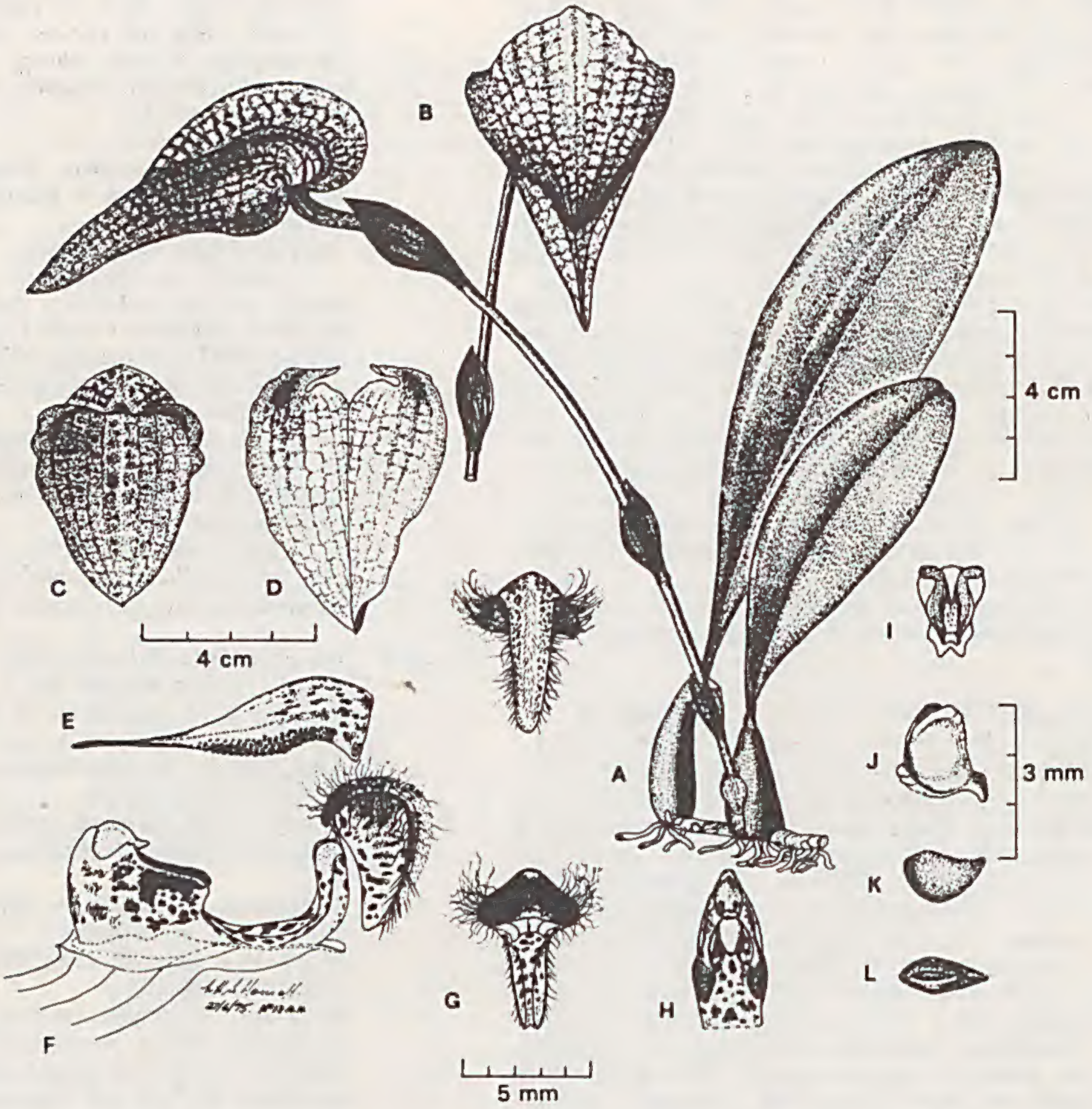
Bulbophyllum cominsii Rolfe in Bull. Misc. Inf. Kew(1895):138; P.F.Hunt in Kew Bull.24(1970): 93.

Ephippium grandiflorum (Bl.) J.J.Sm. in Nova Guinea VIII, 1(1909):95.

Hyalosema grandiflorum (Bl.)Rolfe in Orch.Rev. XXVII, (1919):176.

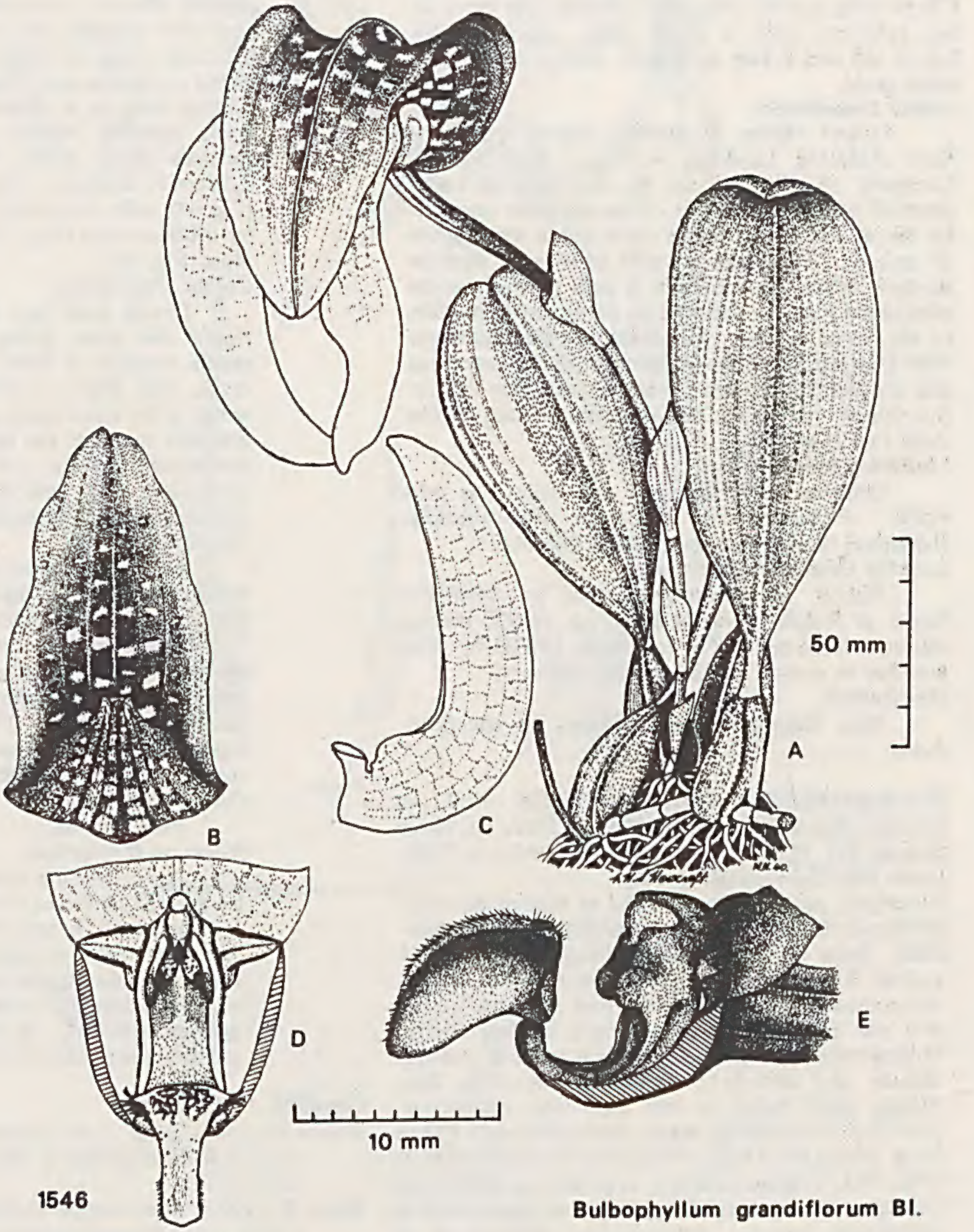
Epiphytic, rhizomes creeping, up to 6mm thick, sometimes partly covered with sheaths. *Pseudobulbs* more or less conical in outline, distinctly 4 angled, 3-3.5cm tall, diameter 1.5-2.0cm, spaced approximately 4cm apart along the rhizome. *Leaf* one per pseudobulb, more or less erect, firm fleshy. oblong-ovate, up to 16.0cm long by 6.5cm wide, obtuse, sometimes apically bilobed, more or less petiolate at base (Fig. 2A). *Flower Stalk* more or less ascending, cylindrical with 4 large sheathing bracts, 12cm or more in length and arising from base of pseudobulbs and rhizomes (Fig. 2A). *Flowers* solitary, large, more or less erect. *Ovary* ascending, cylindrical, smooth, approximately 7.0cm long by about 0.5cm in diameter (Fig. 2A). *Dorsal sepal* oblong-ovate, slightly convex, 0.7cm wide at base, 10.0cm long by 4-6.0 wide, with a distinct dorsal ridge (Figs. 2A-B.). *Lateral sepals* falcate, sometimes partly joined along the basal edge, 10.0cm long by 2-3.0cm wide (Fig. 2C), porrect to lax

FIGURE 1.



Bulbophyllum fritillariiflorum J.J.Sm. 1520

FIGURE 2.



Bulbophyllum grandiflorum Bl.

(Fig. 2A). *Petals* small, more or less triangular, 0.3cm wide at base and 0.3cm long (Fig. 2D). *Labellum* hinged to column foot, mobile, convexed obtuse, 1.1cm long by 0.5cm wide, ventrally keeled (Fig. 2E), margins and dorsal surface with short fine hairs (Figs. 2D-E). *Column* short, 0.5cm long and 0.4cm wide, smooth, with lateral lobes on either side of stigma (Figs. 2D-E); column foot 0.5cm long, curved (Fig. 2E). *Anther cap* more or less reniform with a dorsal ridge, approximately 0.2cm tall and 0.2cm in length. *Pollen* in one firm waxy mass.

Colour Description.

Flower colour is variable among specimens from different localities in Papua New Guinea. Generally the flowers can be described as being greenish yellow and brown, often the paler portions on dorsal and lateral sepals stand out as white spots or squares. The petals are pale green with maroon borders, while the labellum is pale greenish white with some maroon patterns on the broadest portion of the dorsal surface. The column is greenish white with fine red and maroon spots on the column foot and around the stigmatic section; each side lobe of the column has a large distinct maroon spot on the inner face (Fig. 2D).

Flowering Season.

Commences in January and continues into April. Flowering may occur in other months. Individual flowers last up to about 3 weeks.

Locality Details of Specimen.

Found on understory trees in *Acaucaria* forest at Bulolo, Morobe Province, at 800 metres altitude, latitude 7°17'S, longitude 146°31'E. The area has an annual rainfall around 1615mm.

Distribution.

New Guinea, islands adjacent to the Solomons.

Figure 3. *BULBOPHYLLUM TRACHYANTHUM* Krzl. in Oestern Bot.Zeitg. (1894):336; J.J.Sm. in Nova Guinea XII, 1(1913) 83, t.XXII,66; Schltr. in Orch. Dtsch Neu-Guinea (1911):740.

Epiphytic, plant habit the same as that of *B. fritillariiflorum* J.J.Sm. and *B. grandiflorum* Bl. *Pseudobulbs* more or less conical in outline, distinctly 4 angled, 3.5-4cm tall and1-2.0cm in diameter, spaced approximately 3.0cm apart along rhizome. *Leaf* one per pseudobulb, erect, more or less fleshy, oblong-ovate, up to 16.0cm long by 2.8cm wide, obtuse, and slightly petiolate at base (Fig. 3A). *Flower stalk* more or less ascending, cylindrical, with 3 to 4 sheathing bracts, peduncle up to 8.0cm long, arising from base of pseudobulbs and rhizomes. (Fig. 3A). *Flowers* solitary, large but narrower than the other two species. *Ovary* more or less ascending, cylindrical, smooth, approximately 4.0cm long by 0.3cm in diameter (Figs. 3A-E). *Dorsal sepal* lanceolate, elongate-acuminate, 0.4cm wide at base by 6.45cm long and 1.0cm wide, convex at base and with two thirds of the margins involute towards the apex, nerves 7 and roughly parallel, and slightly raised on the dorsal surface of the sepal, fine pustules and hairs on both faces (Fig. 3B). *Lateral sepals* lanceolate to slightly falcate due to a curve in the lower basal margins, 4.2-6.0cm long and 0.4-0.6cm wide, approximately two thirds of margins involute towards apex, nerves 5 and parallel, fine pustules and hairs on both surfaces (Fig. 3C). *Petals* obliquely rhombic, 0.35cm long by 0.4cm wide, 3 nerved with a long cylindrical and pointed appendage at apex, approximately 0.15 thick (Fig. 3D). *Labellum* small, hinged to tip of column foot, mobile, curved and tongue shaped (Fig. 3E), a shallow channel on the dorsal surface (Figs. 3F-G), and with pustules and fine hairs, ventrally keeled, 0.3-0.4cm long by 0.2cm wide and 0.15-0.2cm from dorsal surface to keel (Figs. 3E-F-G,). *Column* short, 0.25cm long by 0.15-0.2cm wide, with 3 protuberances clasping anther, each apically bilobed or toothed (Figs. 3C-E), Column foot 0.2cm long, 0.35cm in diameter. *Anther* more or less reniform (Fig. H), with dorsal and lateral ridges, 0.11cm long by 0.05cm wide (Fig. 3I). *Pollen* in one firm waxy mass (Fig. 3J).

Colour Description.

Dorsal sepal light greenish white with maroon flecks and veins giving a marbled effect; lateral sepals maroon at base, merging into scattered red spots, and then to creamy white; the petals are white with three maroon veins and the appendages are dark maroon; the labellum is greenish yellow on the dorsal surface and has maroon spots on the underside; the column is yellowish green with maroon and pink striations and spots.

Flowering Season.

Not well known; the specimen illustrated was found in bloom in August.

Locality Details of Specimen.

The specimen illustrated was found growing on the trunk of a *Castanopsis* tree in Hoop pine forest at Woitape, Central Province, latitude 08°33'S, longitude 147°15'E. The area has an annual rainfall around 3180mm. The altitude in which the specimen was found is 1,700 metres.

Distribution.

New Guinea.

Notes on Cultivation.

Both the first two species described appear to be easy to cultivate either on trees in semi shade, or in pots with broken crocks and tree fern fibre. Good drainage is essential and moist conditions preferred. *Bulbophyllum trachyanthum* is difficult to grow below 950 metres altitude where dry seasons are well defined. It appears to enjoy well shaded positions with some daily moisture.

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Smith, J.J. (1913) Nova Guinea 12(1):84.

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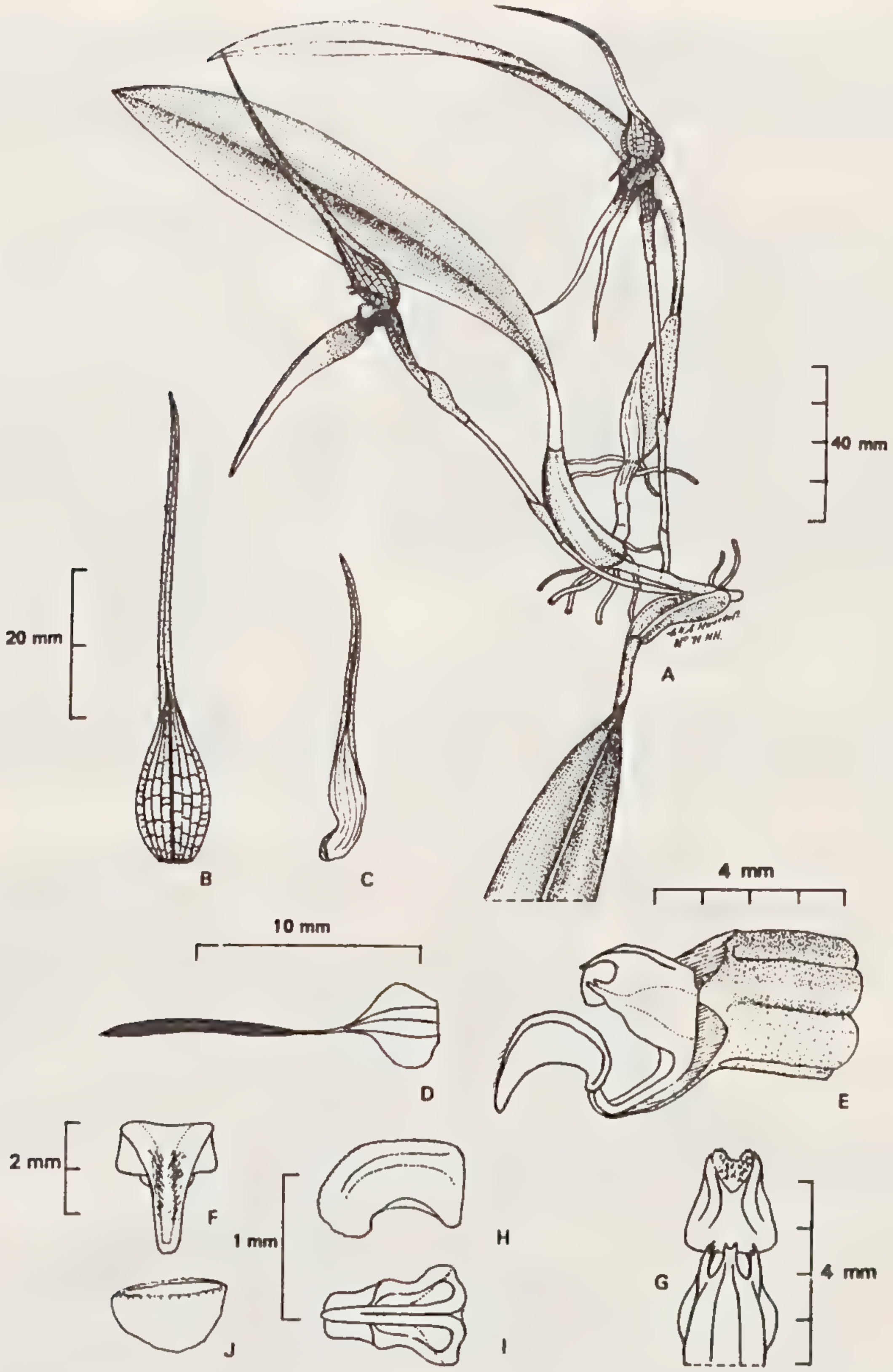
FIGURE 3.



Bulbophyllum trachyanthum Krzl. 1622

The illustrations No.12 NH (Lae's 1520), No.40 NH (Lae 1546) and No.71 NH (Lae 1622) have been lodged with the Lae Herbarium for references and cannot be reproduced without permission of the author.

Some thoughts on *Sarcochilus hartmannii* F. Muell.

by Ted Gregory

Surely one of the most beautiful sights of our local orchid world is to walk around a rocky corner and come across a ledge or face literally cascading with that beautiful green foliage and those glorious iridescent flowers. But I am afraid this is a sight that later generations are to be denied if we cannot drum some sense into collectors, especially commercial collectors. Any collector who takes a keiki or two will not upset Nature's balance very much, but if someone strips the whole rockface, where do we go from there ?

Sarcochilus hartmanni is an orchid of tremendous variety of form, but I guess there is nothing exceptional about this, as, over the years most of our indigenous orchids have developed quite different forms in different localities; so much so that anyone who has had much to do with it can often recognise the clones from particular areas by the flower form and colour, and to a lesser extent, by the plant shape and growth habit too.

Even though *S. hartmanni* would once have been quite common in certain areas, I doubt if it would have ever been really prolific over wide areas as was (and hopefully still is) *D. kingianum,* which even till the last few years really carpeted some of the suitable mountains of the Hastings-Manning region. From my limited experience *S. hartmannii* was always rather exclusive in its choice of habitat and it is this habit that makes it so prone to extinction in the wild.

Southern Forms

I do not know what would have been the southern limit of *S. hartmannii* in years gone by, but the form that inhabits the Manning region is the most southern form that I know of. The plants of this area include a form that has very long slender leaves that are more like the foliage of a typical *S. fitzgeraldii* plant than the normal *S. hartmannii* clone. This long soft foliage could perhaps be attributed to the fact that this form normally grows in fairly heavily shaded and sheltered positions, in fact areas where you would find *S. fitzgeraldii* if you were further north. The leaves of this variety will quite often reach nine inches in length.

There is also a form of this area which grows in much more exposed positions and has a much more typical leaf; stout and falcate, and normally reaching a length of about six inches.

The long-leafed form that I mentioned first is rather a sparse flowerer, with rather long racemes that are quite pendulous. The flowers themselves are rather small, very open between the petals, mainly a speckly yellowish-brown in colour with just a small amount of almost pure white around the outer edges of the petals. The other form that I have mentioned has a similar flower, but normally just a bit better filled in and with slightly stronger colouring.

The varieties that I have seen from the Hastings region are mainly similar to the last plants that I have described; that is, mainly fairly stout foliage and flowers of a very speckled nature with a white perimeter. However many of the Hastings types have a strong erect raceme with a good flower count.

This area has also produced a variety with much heavier foliage than the types mentioned; the leaves of this variety are thick and fleshy, quite like the Blue Knob form, which I think is regarded as "typical" *S. hartmannii* by most orchid growers.

This form has a strong reddish stemmed upright raceme that displays its flowers well. Also, this form has a far superior flower that runs almost to an inch in diameter, is a glistening white, with a small reddish-brown centre. In fact, when I first saw this form, I thought someone was trying to fool me with a piece from Blue Knob.

The Carrai Plateau Form

The only other central coast form that I have heard of is the variety from the Carrai Plateau which is on the Macleay River system. If the clones that I know are any guide this is a very even form as most I know are very difficult to tell apart; in fact almost impossible. I believe also that this Carrai form was very prolific in its area in days gone by, as I have heard quite a few old growers talking of their experiences up there years ago. Even though I have grown this form for years I am sorry to say I have not seen it growing in its natural glory; one of the disadvantages of being a dairy farmer: one finds it very hard to get far from his work when on a seven day per week job.

This Carrai form is very much like the common form that I described beforehand in growth and flowering habit and is also very vigorous and easy to grow in captivity, as quite small pieces of it will grow into a specimen plant in no time.

I guess there are localised forms of *S. hartmannii* more or less all the way up the north coast of New South Wales, but I have no knowledge of them myself, so I cannot comment on them if they do exist. Perhaps other Orchadians may be able to supply details of these and help to enhance our knowledge and hopefully help in the conservation of these wonderful plants.

The Mount Lindsay Form

The next form I can perhaps comment on is the variety known as "Mount Lindsay", which comes from the area of the same name on the N.S.W. – Queensland border. This form is a very robust grower with thick, fleshy leaves and an upright plant habit.

The racemes of this form have stems that are generally yellowy green in colur, upright in habit and of shortish nature, but carrying beautiful clear white, filled-in flowers of good shape with normally a brown to reddish centre. This form is a very free flowerer and a well-grown specimen will at times be literally a mass of white as those short racemes all stand up and display their flowers to perfection.

The Blue Knob Form

And, last but not least, is the famous form known as "Blue Knob" after the mountain of its origin. I climbed quite an area of this mountain some years ago and the sight of this magnificent orchid blooming in its natural surroundings was one of the highlights of my orchid growing career. The only sorrow I have regarding this day was the fact that I had no camera with me. I had quite a bit to do with this Blue Knob form before I went up there, but the thing that amazed me most was the variation in colouration of the centre of the flowers from clone to clone. Some flowers were completely white and the range went right through to the other end of the scale, with red centres almost as big as in the normal *S. fitzgeraldii* flower.

The Blue Knob form to my knowledge has the heaviest growth habit of all the *S. hartmanni* types that I have seen, with very heavy leaf growth, normally deep green and waxy. Even though I found the clones very even in growth appearance I noticed considerable variation in raceme habit; some plants having quite pendulous racemes whilst others had a very upstanding habit. Another almost universal trait was the wine-coloured stem of the raceme, but I did notice a few clones that had almost clear racemes like the Mt Lindsay form.

As I mentioned earlier there was considerable variation in the colouring of the centres of the flowers, but the outstanding feature overall was the glistening whiteness of the flowers. I guess I am inclined to rave on at times, but it is surely hard to do justice to these flowers and a fitting description could be made with these two words: glistening iridescence.

Another feature of this form is the evenness of the size of the flowers, most of them being around the size of a ten cent piece, with odd ones being a little larger, almost to the size of a twenty cent piece. The racemes were much longer than those of the Mt Lindsay form and not so densely-packed per plant.

Culture

All the forms of *S. hartmannii* can be easily grown in captivity in my part of the world if one remembers the golden rule of growing them in the bush house, that is, drainage as close to perfect as possible and good air movement as well. Many potting mixtures have been used with good success and about the only thing some of them have in common is the good drainage factor. I personally like a mixture of oakbark, charcoal and sandstone which works well for me and lasts for years. Choice of pots seems to be a matter of choice too, but if I am going to sit the plant on a bench I like a terracotta saucer for preference.

If it is to be put on a bench one must make sure it will receive good air movement or the plant will suffer from fungus problems in a humid autumn. If one is doubtful on this point it may be a good idea to hang the plant in an ordinary wire basket lined with a piece of shadecloth. This shadecloth will last for years, whereas ti-tree bark will fall apart long before the mixture starts to fail. I find really good results hanging my plants five or six feet above the ground where I seem to have much less fungus problems; and it also creates more bench space.

As far as watering is concerned, I think *S. hartmannii* is better a little on the dry side rather than the wet side, especially in the cooler parts of the year. It is not a great lover of nitrogenous fertilizers and seems to prefer a trace-element type fertilizer which should be used lightly all year round. As will most of the sarcochilus species, *S. hartmannii* makes its best growth in autumn-winter when most of our natives are more or less dormant.

One of the features of *S. hartmannii* in all its forms is the root system of the plants. The roots are so fat and fleshy that they could almost be mistaken for vanda roots. They last for years on a well-cultured plant. I have seen plants tipped out at times when there was hardly any mix left in the pot, just a great ball of white roots.

I would like to finish this note with a couple of queries on *S. hartmannii* that other readers may be able to answer or comment on, as one of my main aims with these notes is to stimulate interest and discussion on these wonderful orchids.

Firstly: that mountain on the border where the pink *S. hartmannii* is fabled to grow: perhaps this is legend just like the pink "rock lily" and the pink *S. falcatus.* Who knows ? But at least we now *know* of a pink *S. falcatus* or two.

Secondly: whilst on Blue Knob, I noticed many plants of *S. hartmannii* growing on Sandpaper Figs and Red Mountain Oaks. These plants were in all sizes up to flowering size, but I never saw one in flower or any bigger than just flowering size. Could it be that fires destroy them on the trees every so often or do they need some mineral or element from the rocks that are their usual host to sustain them ?

Sarcohilus hartmannii F. Muell.

Drawing: Keith Betts.

Book Review

by * J.S. Womersley

ORCHIDS OF PAPUA NEW GUINEA An Introduction: Andreé Millar, photographs by Roy and Margaret Mackay. Australian National University Press, Canberra, 1978. Australian Price $9.95. (Our copy from the Publishers.)

Andreé Millar's long awaited book *Orchids of Papua New Guinea, an Introduction* will be welcomed by all people interested in the natural history of that country. This book is the result of some thirty years residence in Papua New Guinea during which Mrs Millar's interest in orchids, which started as a collector on week-end walks with her husband and family at Bulolo, developed extensively. In March 1956 her collection of growing plants included many of the species common in the forests and grasslands of the Bulolo and Watut Valleys. At this time the developing National Botanic Garden at Lae wished to establish a collection of native orchids. Word reached me that the Millar family were about to leave Bulolo and through the good offices of the then Director of Forests, the Millar collection was purchased and shortly after, when the family moved to Lae, Andreé Millar joined the staff of the Botanic Garden as an assistant to the Curator. For some ten years Mrs Millar continued to develop her orchid interests with the resources of the Botanic Garden and the Division of Botany library and had the opportunity to participate in many field trips.

At the time of her move to the University of Papua New Guinea in February 1971 where she was to develop a garden for the support of biology teaching she was acknowledged as the most knowledgeable person regarding the collection and cultivation of indigenous orchids from Papua New Guinea. Subsequently, while employed by the University of Papua New Guinea, Mrs Millar extended her interests with the introduction of many exotic orchids and built up the very fine collection of living plants which is now the centre-piece of the National Capital Botanic Garden. Readers may not be aware that the main Botanic Garden for Papua New Guinea is the National Botanic Garden established in Lae in 1949 and continuously developed by the Division of Botany of the Papua New Guinea government. The National Capital Botanic Garden in Port Moresby is the development of the teaching garden started at the University of Papua New Guinea by Mrs Millar.

This book then is the culmination of experience and observation since the late 1940's. It should be mentioned that the people who influenced Andreé to pursue her orchid interests at Bulolo include Hermon Slade and officers of the Department of Forests. At Lae, the late Jim McAdam, first Director of Forests for Papua New Guinea arranged both the purchase of her Bulolo collection and her subsequent employment at Lae.

The interested visitor to Papua New Guinea has for a long time needed an introductory book to the orchids of Papua New Guinea. This book sets out to achieve this objective. Through the use of the photographs by Roy and Margaret Mackay and associated brief text descriptions some 157 species are included. There is one page of drawings of the essential parts of an orchid flower and the orchid plant which has been prepared by students of the National Art School of Papua New Guinea. In this regard more detail of the column, rostellum, pollinia and stigmatic disc, all of which are important to anyone attempting the identification or hybridisation of orchids would have been advantageous. The drawings are well executed but I see no indication of the actual artist(s). I would suggest that 'dorsal' would be preferable to 'upper' sepal, particularly as most orchid flowers are rotated through 180° during the development of the bud to open flower so that the 'upper' sepal starts as the lower sepal. There are a few genera of orchids in which this rotation does not occur. The use of 'dorsal' is always clear, meaning the sepal opposite the labellum whatever may be the position of the flower in relation to the axis.

The brief chapter on "Where Orchids Grow" and "Climatic Data" will assist visitors and residents to know where to look for wild growing plants, and also those attempting to cultivate orchid plants from Papua New Guinea outside the tropics, to have some idea of the cultural conditions needed. Readers are here also to be referred to the altitudinal distribution of vegetation shown inside the front and back covers. Continuing the introduction to the orchids of Papua New Guinea we are given a table of the genera and species said to occur in Papua New Guinea. This table is attributed to Dockrill *(in Encyclopaedia of Papua New Guinea, (1972))* but it is important to note that the figures reproduced are those for the 'New Guinea Region — the island of New Guinea, the Bismarck Archipelago and Bougainville'. The figures given in the *Encyclopaedia* for Papua New Guinea are in general approximately 2/3 of those quoted by Mrs Millar.

The author then gives a detailed description and illustration of a selection of species. Each species is illustrated by a photograph of the flower printed about 78 mm square and in the case of a few species a full page plate of growing plants. These pages continue the description of the species in a curiously mixed way. I am quite unable to find any explanation for the arrangement of the species. A final chapter gives information on cultivation of orchids under Papua New Guinea conditions. The main text is complemented by a short article on the photographic techniques used by Roy and Margaret Mackay. This will be useful to amateur photographers who wish to succeed, as have the Mackays, with outdoor photography in the tropics. The book concludes with a glossary, a short account of botanical names and authors, references and an index.

The author is to be complimented on bringing together this material and presenting it in an attractive format. Although she explains that *Orchids of Papua New Guinea* is not a botanical work, the purchaser and reader of any such book is entitled to believe that the material presented is as accurate as possible. Unfortunately in this regard the author and publishers have both fallen short in the checking of facts and the proofreading of the work. Errors of fact and taxonomic judgement, spelling errors and inconsistencies abound. There is scarcely a page for which an all-clear can be given. Explantions will no doubt be forthcoming for this, but, as the book is directed towards users who are themselves not specialists who will pick up spelling errors and mentally correct them or make a pencil note, it behoves the Australian National University Press, if it values its reputation for publishing excellence to produce a corrigenda for inclusion in as many copies as possible.

In this review space will not allow dealing with all the errors and inaccuracies. The typeface used is pleasant to read. Species names in captions are printed in bold face, in the text in italics except on p. 23 *Dendrobium lasianthera* is not italicised. On page 34 the plate caption for *Dendrobium forbesii* var *praestans* is of mixed type faces. Page 99 provides a very brief explanation (quite adequate for this book) of the use of the names of authors of species. The use of the author's name in a botanical context can be either in full, as an abbreviation or as a contraction of the surname of the author, with or without initials. We find inconsistencies in the author abbreviations in this book — for example, "Lindl." is the accepted abbreviation for John Lindley, not the Ldl. frequently used here. "Schltr" is a contraction for Rudolf Schlechter and should not be followed by a full stop; F. Muell. for Ferdinand von Mueller, not F.V.M. or F.v.M; Benth. not Bth. for George Bentham, botanist and author of the *Flora Australiensis* (omitted entirely on page 99). F.W.L. Kraenzlin, the author of many species of orchids should be referred as Kraenzlin. A list of author abbreviations has been produced for both the Flora of Papua New Guinea Project and Flora of Australia Project. One of these would have been available to both author and publisher of this book.

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* Mr J.S. Womersley was formerly (1946 — 1975) Assistant Director, Botany, Department of Forests, Lae, Papua New Guinea.

Spelling and other errors which need to be pointed out are:

Page 1: *Antidesma ghaesembilla* not ghaesambilia

The use of an 's' to make a plural of a latin name and to continue to print the name in italics e.g. *Bulbophyllums, Dendrobiums* is quite incorrect. The word should be decapitalised and printed in ordinary type face.

Page 5: *Nepenthes mirabilis* and *Platycerium* are indigenous plants, not exotic, to Papua New Guinea. The correct name for the *Platycerium* is *P. wandae* of which *P. wilhelminae-reginae* is a synonym. There is no plant named *P. superbum reginae.*

Page 12: Karkar Island, not Karkare.

Page 19: J.J. Smith was a Dutch botanist who worked at the botanical research Institutes at Buitenzorg, (now Bogor). He never visited the island of New Guinea although he handled many specimens from there and from live plants brought from New Guinea and cultivated in Buitenzorg Botanic Garden.

Page 23 line 11: The name *Dendrobium lasianthera* should be in italic type face.

Jan van Bodegom was the Resident Commissioner at Manokwari , not a botanist. He is a keen naturalist who collected plants widely throughout West New Guinea. The garden of the Manokwari Residency was a mini botanic garden with literally hundreds of orchid plants growing happily on supports. He was much encouraged by the Botanist for West New Guinea, Dr Wim Vink in preparing the photographs which illustrate his book *Einige Orchideen van West Nieuw Guinea.*

Page 46: The subhead 'the Dendrobium Phlox Alliance' refers to the two lower plates. In the caption Phlox should be decapitalised.

Page 47: There is no caption to the right hand plate which is *Dendrobium smillieae* F. Muell.

Page 55: The brackets around Lindl. are not required.

Page 57: Remove the L. after (Schltr) J.J. Sm.

Page 69: The correct spelling is *S. portus-finschii* Kraenzlin.

Page 70: Reichb. f. as used here is to be preferred to Rchb.f used elsewhere in the book.

Page 75: *Coelogyne alata* no author is given and I am unable to find that this is a valid botanical name.

Page 79: The author should be abbreviated as Hook. f. not Hk.f.

Page 84: the author is T.E. Hunt, not T.T. Hunt.

I must come now to the most serious criticism of the contents of this book, namely the taxonomic judgement exercised by the author in areas where published literature refutes the opinions expressed in this book and the number of examples of just plain errors of identification which indicate that the photographs and text were not examined by any professional botanist before publication. This is most unfortunate as the book is designed for the uninformed reader who should be able to accept implicitly the accuracy of the names and information given in the book. I cannot deal at length with all these errors of judgement but point out the following:

Page 2: *Dendrobium antelope* is a species from the Molucca Islands. It is not the species common in the P.N.G. Highlands. This latter species appears to be un-named.

Page 8 et seq: Readers are referred to the paper in Kew Bulletin vol. 24 pp 88-90 where Mr P.F. Hunt then orchidologist at the Herbarium, Kew, clearly refutes the use of *Dendrobium lineale* and shows that the type of that name is synonymous with the type of *Dendrobium gouldii.* A more detailed account of this paper will appear in a future issue of *The Orchadian.*

Page 13 and elsewhere in the text: *Dendrobium strebloceras* (not *D. streblosceras)* is a species from the Sunda Islands. It is described in *Gardener's Chronicle* 1886, 1, p266 and 1887, 1, p140 and beautifully figured in *Lindenia* III, pl. CXXIV. Examination of the description and plate indicate marked differences with the plant commonly called 'Tangerine' from the Markham and Ramu Valleys of P.N.G. Further, Mrs Millar was well aware that many years ago Lae Herbarium borrowed a portion of the type material of *D. strebloceras* from Vienna. Today, in the Lae herbarium there are photographs of the type and at least one loose flower, which confirm that the P.N.G. plant is related to but quite distinct from *D. strebloceras*. A further note on this problem will be published in *The Orchadian,* but for the present the only name available for the Papua New Guinea plant is *Dendrobium sp.* 'Tangerine'. There is no validity in the name *Dendrobium tangerine* which is not published.

Page 14 et seq: Although widely used by growers of orchids from Papua New Guinea the name *Dendrobium sophronites* Schltr is predated by *Dendrobium cuthbertsonii* F. Muell, Schlechter, in describing his species, stated that the flowers were larger than in *D. cuthbertsonii.* However, examination of the original descriptions shows that the flower sizes described by each author are not significantly different. Further, as Mrs Millar well knows this very common mountain orchid varies considerably in flower size and colour. *D. cuthbertsonii* was described from Mount Obree in the Owen Stanley Range. I suspect that the plants photographed in the present book are also from the Owen Stanley Range, probably from near the type locality of *D. cuthbertsonii* F. Muell. This name should replace *D. sophronites* wherever that name appears in the text.

Page 16: The photograph of *Dendrobium schulleri* J.J. Sm. is incorrectly identified. This is nothing more than a form of *D. mirbellianum. D. schulleri,* which probably does not occur in Eastern New Guinea has a large spathulate dorsal sepal with a blunt, not acute apex. The form illustrated may well be the *D. buluense* Schltr which has been included in the synonomy of *D. mirbellianum.*

Doubt must be expressed about the use of the name *Dendrobium pseudo-conanthum* J.J. Sm. as that species comes from the Celebes and has not been recorded from New Guinea.

Page 23: In the last paragraph on this page we read that the flower structures of *Dendrobium ostrinoglossum* and *D. lasianthera* are different — a matter with which I do not agree. The author makes no further attempt to justify the use of *D. lasianthera* for the "Sepik Blue" etc. Only a comparison of the types of the two species can confirm, what is apparent, that these names are synonymous. Until this is done by a recognised botanist I suggest that *Dendrobium ostrinoglossum* Rupp be used as the name for this plant where it comes from Papua New Guinea and is predominately of a red or pink colour.

D. lasianthera from West New Guinea is a definite brown with deep purple.

Page 28: *Dendrobium capituliflorum* Rolfe may be identical with *D. ophioglossum* Reichb. f. (for a note on this *possibility* see D.F. Blaxell in *Orchadian* Vol 5. No 6, page 88 – Ed.)

Page 34: *Dendrobium acerosum* Lindl. comes from Burma and Malaya. The plant illustrated is *D. macfarlanei* F. Muell. Also on this page there is an unfortunate change of type face in *Dendrobium forbesii* var *praestans;* this is quite unnecessary.

Page 36: The illustration of *D. dryadum* is not so. The petiolate leaves clearly show that the plant photographed is *D. petiolatum* Schltr.

Page 37: *D. quinquecostatum* does not have a reflexed lip. The plant illustrated here is that generally accepted as *D. uncinatum* Schltr.

Page 38: I see no reason to suggest that the north Queensland plant *D. malbrownii* Dockrill occurs in Papua New Guinea. The usual name for the P.N.G. plant is *D. poneroides* Schltr or *D. isochiloides* Kraenzlin.

Page 39: The use of *Dendrobium cancroides* is thought to be incorrect for this illustration which is probably a high altitude species of this same group.

Page 41: The illustration named *Dendrobium macrophyllum* is *D. polysema* Schltr. There is much confusion about the use of *Dendrobium macrophyllum* but reference to the early illustrations of that species indicates flowers without setae (bristle-like hairs) on the back of the sepals and petals.

Page 42: The correct spelling is *Dendrobium rhodostictum* Schltr. (not rodostichtum).

Page 45: The plant illustrated top right is *Mischobulbum lancilabium* Schltr.

Page 49: read *Bulbophyllum cruciatum* J.J. Sm. for *B. cinciatum* which is not a name.

Page 50: The plant illustrated as *Bulbophyllum fletcheranum* Rolfe is most definitely *B. macrobulbum* J.J. Sm. which includes the synonym *B. balfourianum* Hort. ex Gardener's Chronicle.

Page 51: *Bulbophyllum orthoglossum* is a species from the Celebes. The New Guinea plant is usually identified as *B. oobulbum* Schltr.

Page 52: the names *Bulbophyllum fritillariflorum* and *B. arfakianum* need to be transposed.

Page 53: The plant illustrated as *B. halianum* Schltr is not so. This species which is very widely distributed in New Guinea and has acquired several names may be identified as *Bulbophyllum masdevalliaceum* Kraenzlin or *B. cheiri* Lindl. The true *Bulbophyllum hahlianum* Schltr (note correct spelling) is illustrated by Schlechter, plate 935, and is in a different section from *B. masdevalliaceum.*

Page 55: This photograph appears not to be *Bulbophyllum macranthum* Lindl. which is well illustrated on page 54 and 56. The page 55 plant is very like Schlechter's illustration of *B. hahlianum.*

Page 70: A serious error occurs here. The illustration named *Thrixspermum arachnites* is actually a species of *Bulbophyllum* in the section Dialeipanthe quite probably *B. distichum* Schltr. It may well be that *Trixspermum arachnites* is a synonym of *Trixspermum platystachys* (F.M. Bail.) Schltr.

Page 88: The plate identified as *Habenaria goodyeroides* is not so. That species has only short spurs, the flowers are clustered more closely on the inflorescence and are smaller.

The following plates require turning through 90° or 180° p. 30 *Dendrobium trilamellatum,* 180°; p. 34 *D. acerosum* 180°; p. 39 *D. roseipes, 90°;* p. 48 *Bulbophyllum* c.f. *elisae,* 180°; p. 52 *B. grandiflorum,* 180°; *B. arfakianum* (as labelled), 180°; p. 55 the small plate which is incorrectly labelled *B. macranthum* turn through 90°; p. 59 *Robiquetia mooreana,* 180°; p. 63 *Grammatophyllum scriptum,* 180° (this illustration is correctly positioned on the back dust jacket); *Grammatophyllum papuanum,* 90°; p. 69 top right through 90°; lower right 90°; p. 83, *Pomatocalpa marsupiale* 180°.

The author concludes the book with a short chapter on the methods used to grow the indigenous orchids under Papua New Guinea coastal conditions. This information is well presented and portrays the author's extensive knowledge in this area. Errors of typography and spelling unfortunately continue. *Plumiera rubra* is generally considered to be a variety of *P. acutifolia;* for *Plumiera obtusifolia* read *Plumiera obtusa;* the former is not a botanical name. The cultural techniques used are well described and will enable anyone not conversant with the methods to follow the procedures. Further, this section will prove very useful to orchid growers outside Papua New Guinea as, for example in tropical Australia, who can either follow the various suggestions or adapt them to their own resources. The book is entirely devoted to the indigenous orchids of Papua New Guinea. It is therefore to be expected that no mention is made of the cultural techniques used for exotic orchids in P.N.G. However, as most residents growing indigenous species will also be growing exotic species and hybrids of the *Vanda, Arachnis* and *Renanthera* alliance some brief comment would have been useful.

Conservation of the indigenous flora of Papua New Guinea and restrictions on the removal of plant material from the country are not mentioned in the book. This is unfortunate, as the visitor who buys this book may get the impression that he can take away whatever he sees growing. It is very difficult to obtain the precise regulations and restrictions that apply and the procedures to be followed in obtaining permits to collect and remove plants. This book would have been a convenient place to clearly state what these are.

The chapter on photography by Roy and Margaret Mackay will be very useful to visitors essaying any type of nature photography in Papua New Guinea. The photographs used in the book are of two types, scenic and environmental photographs usually printed full page or the small photographs usually of the flower alone which illustrate the species described. These in themselves are useful but would have greatly enhanced the book if more details of the plant form and growing situation were shown. Photographs of plants *in situ* are far more informative than those used and I am sure that Mrs Millar has, or has access to, many slides of value here. The reproduction of the photographs is generally satisfactory (apart from incorrect positioning). Some of the prints lack the definition which is, I am sure, in the original Mackay transparencies.

The glossary is short but will enable the interested readers to understand more fully the technical terms used. It should however be noted that "callus" is a botanical term, as distinct from "callous".

The appendix of author names is well introduced but includes a number of errors in the detailed section. The author and the publishers are referred to the lists of authors names, abbreviations or contractions which have been prepared for the Handbook *Flora of Papua New Guinea* and *Flora of Australia Project* and from which the following corrections are taken: Blume, C.L. (Carl not Karl); Don not Don.; Koenig for J.G. Koenig; Kraenzlin, not Kranzl. or Kzl. for F.W.L. Kraenzlin; Lindley not Lindly to be abbreviated Lindl.; Reichb. and Reichb. f. are clearly transposed and should be abbreviated as used here; Ridley is preferred to Ridl.; R.S. Rogers should be printed in full as there are other botanical authors of that name;

the Rupp in question is H.M.R. Rupp, not T.E. Rupp; finally Schltr for Schlechter.

All in all this is a welcome book. Hopefully sales will be rapid and the initial printing sufficiently small to allow a new edition to be planned in which much more care can be taken by the publishers to ensure the accuracy of text and placement of photographs. I firmly believe that the publishers rather than the author must accept responsibility for much that is unsatisfactory with this book. The book is probably a "must" for visitors to Papua New Guinea who are interested in orchids — there is nothing else — and those resident elsewhere who wish to cultivate species from Papua New Guinea.

John S. Womersley, 82 Richmond Road, Westbourne Park, South Australia, 5041.

Books Received for Review.

Flora of South Australia, Part 1, 3rd Edition by J.M. Black. This revised edition of 1978 is to hand from the publisher, the Government Printer of South Australia and will be reviewed in the December issue of the *Orchadian.* Meanwhile an indication of its up-to-dateness is seen in the fact that the Section on the Orchidaceae (revised by R. Bates and J. Weber) includes the new *Prasophyllum goldsackii* described in this issue at page 17.

Ten Year Index to Plant Illustrations in 10 Influential Orchid Periodicals, compiled by George E. Woolfson. Published by Twin Oaks Books, Michigan, U.S.A. Price $7.95 (U.S.) postpaid. Even a preliminary scanning of this work shows that it is a well-presented, carefully prepared reference book for all those (growers, writers and lecturers) who need a quick aid to finding orchid illustrations. The 9000 references obviously could not be checked for accuracy in the short time since it came to hand (August 11), but the section on "The Publications" gives a good indication of Mr Woolfson's accuracy and balanced judgement in assessing the worth of the various journals — which incidentally include the *Orchadian;* not for 10 years past, but over its entire 15 years to 1977.

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RUPP'S CORRESPONDENCE — An appeal

H.M.R. Rupp was one of our great botanists. This is apparent from his published work "The Orchids of New South Wales". Mr D.F. Blaxell, Senior Botanist of the Royal Botanic Gardens, Sydney, in examining some of the correspondence from Rupp to T.E. Hunt recently discovered some new evidence as to the date of publication of that work and a short paper on this will appear in the December *Orchadian.*

Meanwhile we should like readers to realise the importance to botany of any letters by Rupp that may have been kept by their recipients or passed on to their relatives. In the course of his studies and research the Reverend Rupp wrote many letters to many people — botanists in other States, field naturalists who sent specimens to him and so on. Some,of course, have been destroyed because their value to botanists may not have been recognised. Mr Blaxell, who may be regarded as a successor to Rupp in respect of the orchids of N.S.W., wishes to appeal to any reader who may be able to help bring such letters to light. If you have any clues whatever would you please contact Mr Blaxell personally, or through us ?

SPRING CULTURAL NOTES 1978

Isn't it marvellous how quickly a year can fly by ? It only seems a few weeks since I sat down to write last spring's notes and here we are in September again; this fabulous time when Nature shows us what rejuvenation is all about.

As this reaches you a great deal of our natives will have already finished their flowering and will be entering their growth period again, whilst there will be many still to come and extend the flowering period through 'til Christmas. Quite a few people complain that anyone who only grows natives only has flowers for a short time each year; personally I find that anyone who takes the trouble to grow a reasonably wide sampling of our native orchids will have a flower or two out at almost any time of the year.

Most of us at the present time could be excused for doing a "Ferdinand" that is just sitting and sniffing the flowers as Walt Disney's famous bull once did. But as with most hobbies, if you are industrious enough there will always be something that could do with a bit of attention. To my mind one of the main things at this time of year is to keep a regular check on the aphid position; these little devils can deform racemes and buds so fast that it is not funny. A puff of Topclip (R) dust will keep aphids and most other chewers clear and will not mark your flowers unless used in huge excess. This is a Diazanon powder, and as with all of these insecticides, all due care should be exercised.

As soon as a plant has finished flowering it is a good idea to cut off the spent flower spikes to tidy up the plant; at the same time the plant can be checked to see if it needs repotting. With most of our natives the most important things to look for are broken down compost or the plant growing out of the pot. If none of these factors has arisen the plant is just as well off left alone till next year.

No plant likes being kicked out of its pet pot if it's enjoying itself where it is. This leads to that most important part of our growing, that is our compost. As I have said before one should aim for a compost that will last for at least two years, and for preference four.

If you have followed a good fungicide programme over the year you should not have trouble at this time of the year. However if you feel the need to take action, be sure you use something that will not mark your flowers, such as Benlate (R). If you happen to strike showery weather during the flowering season Benlate can be handy as it will help prevent your flowers from spotting.

There is no doubt that a covered area is handy at flowering time if you can manage one, as your flowers will last so much better if you can prevent them from being bent over by spring showers.

It is easy to wander on with notes like this, but when our editor is getting lots of new material to publish, it is a pity to make an article overlong when one can get a lot of it from back issues of the "Orchadian".

Good growing 'til next time.

Ted Gregory

The Australian Orchid Foundation

extends an open invitation for application for support or grants by any person or group who has a desire to do specialised work on any subject that relates to the orchid species whether they are endemic or otherwise. The work must be performed within Australia. All applications to be addressed: The Australian Orchid Foundation, C/o 107 Roberts Street, Essendon, Victoria, 3040.

Electronics in the Glasshouse

by G.C. Morrison M.A.I.H. FLS.

The reader will be aware that we are continually being surrounded by devices controlled by electronics. Traffic lights which were purely electrically operated have gone over to electronic sensing and logic switching systems, sewing machines now incorporate electronic mini-computers to programme the stitching. If you wish to travel somewhere the pressing of a few buttons will make your reservations almost world wide, even the breathalyser to test for drunken driving has advanced to electronic readout. It is inevitable, therefore, that some of this technology must eventually be applied to control the enviornment of glasshouses. Large commercial houses can, no doubt, afford advanced technology and expensive equipment. The small grower usually has to improvise, or at least fit cheaper and simpler systems to obtain automatic control of the enviornment.

Glass house automation is not new and has been done quite reasonably in the past by straightforward electrical means using individual sensors as controls. Two examples come to mind. In 1961 Evans described what he called a "substantially fully automatic" system controlling humidity, low temperature, high temperature and ventilation. He did not, however, control watering. In 1975 Gould-Adams mentioned an orchid house where 15 time clocks and 9 thermostats were devoted to the orchid's welfare.

The obvious disadvantages of these systems are:-

1) Integration between the control systems is troublesome to accomplish, usually beyond the capacity of the grower to devise and install and, therefore, is not done.
2) The whole system works at mains voltage, which is not very safe in a normally wet glasshouse environment, the installation must be permanent and is not easily changed.
3) It is something of a task to alter a collection of time clocks and re-set thermostats to secure the desired operating conditions and thermostats vary with time and need rechecking.
4) While the interlocking of relays is capable of performing simple logic functions, this is limited and can be expensive if multicontact relays are required.

A logic function is a decision (made initially by the grower and repeated electronically) whether both sensors A *and* B must together operate a device (e.g. a fan) or whether A + B + C must do so or whether *either* A *or* B can operate the device or whether *neither* A *nor* B should do so in the absence of C. Substitute factors such as temperature (high or low) ventilation, humidity, light or whatever for A,B,C, and you can imagine that the permutations can be large.

We are not only concerned with the existence of A,B and C but with how much of A,B and C we need (or do not need) in order to function a device. A simple example of this, familiar to all, is how much cold do we need to turn on the heater. It is not just a matter of cold being present or not present; but its level is important. The thermostat measures this level and at "trigger point" turns on the heater. When the level of cold is reduced by the heater the thermostat measures this and turns the heater off. This is an example of analogue to digital conversion common in electronic circuits and necessary in glasshouse control where environmental characteristics are measurable and fluctuate over a range of values. The sensor (thermostat) is measuring a continuous variation of heat magnitude and at one point converts this to digital information, ie. the heater is told to "turn on". A "bit" of information is supplied to turn the heater on and another "bit" to turn it off. Once the analogue data are converted to digital information, control circuits can be activated.

Some of the advantages of electronic control may be summarised as follows:-

1) Most of the wiring is at a potential of 12 volts or less and is, therefore, quite safe to handle even in a wet situation.
2) Logic reasoning by the grower, can be converted to electronic logic circuits for control of devices in many combinations or to exclude devices from operating until a set of conditions is met.
3) The operating levels can be set into the system by a series of control knobs. These levels can be changed just as easily as the volume from a radio receiver is changed.

To illustrate just a few of the above points I shall describe a part of my own automatic system for environmental control, namely the part that controls watering. One such system is used for the glasshouse. Other separate systems control watering in a roofed-in but completely open-sided "bush-house" and also in a fibreglas house.

Many growers prefer to water by hand. They say this provides an opportunity to inspect the plants. I suggest that ample opportunity exists to inspect the plants if one is not tied to the chore of watering. I feel that anyone who has experienced automation of any kind would be unwilling to return to manual methods. How many people willingly use manual control of the glasshouse heater and get up during the night to adjust this, in lieu of fitting a thermostat ? Much the same can be said for auto-watering. One can go away on holiday, go to hospital or whatever without needing to rely on friends and relatives to do any more than just occasionally check that the system continues to function.

The most difficult part of any electronic system is the transducer, the device which turns other forms of energy into electrical energy. A familiar example of a transducer is the pick-up head of a radio-gram which converts mechanical energy from passage over the record grooves into electrical waves. Fortunately solid state electronic devices are made which are both temperature and light sensitive, providing readily available transducers for these two factors. Dryness/wetness transducers are a little more difficult. I use a plaster-of-paris block, the size of a matchbox, into which copper electrodes are embedded. This changes resistance with wetness and forms an analogue type sensor.

The diagram shows that analogue information is provided by three sensors; Temperature, Light and Water. This information is amplified separately and the desired percentage of each (as selected by the grower by setting a front panel knob) is passed to a summing circuit where these percentages are added together. When the summed analogue value reaches a pre-set trigger level, the analogue information becomes digital or 1 as it is often called. This turns on the water supply. When any analogue input from any sensor falls, the sum of all three falls and digital 0 is reached which turns off the water. An example of this is when a cloud passes across the sunlight, the light sensor output reduces to a low value and watering stops for the duration of reduced light. When sufficient water has been delivered, the watering sensor output falls and watering stops until the sensor dries out again. The temperature sensor ensures that watering does not occur unless the temperature (either inside or outside the glasshouse as desired) is satisfactory. If the light output is very high and the water sensor very dry, the outputs from both of these may be set to give a digital 1, when summed, and so supply water.

The three percentage selectors allow the grower to set in, and change in a matter of seconds, suitable values for temperature, light and water. Typical values are 40% for light, 40% for temperature and 80% for water. As this is a watering unit it is reasonable that wetness should have more effect than other factors. However, if the temperature percentage is increased and misting is used for applying water, then, failing any alternative system, this misting may be applied in short bursts to control excessive temperature rise in summer, so keeping the glasshouse both moist and cool.

The type of light sensor used in the above system is very directional and responds to light from a very narrow angle. Good use may be made of such a feature to regulate the times of watering during the daylight periods of both summer and winter. At a latitude of 35 degrees south, the summer sun sweeps through an azimuth of some 200 to 215 degrees about north. By properly orienting the light sensor automatic watering may be achieved in the early morning and through to say, 3 pm after which watering is not possible. During winter the watering period is further restricted as the sun does not gain a reasonably high altitude until 10.30 am so that early morning watering (using cold water) does not occur. Also watering is stopped after about 1.30 pm when the altitude of the sun falls below 30 degrees.

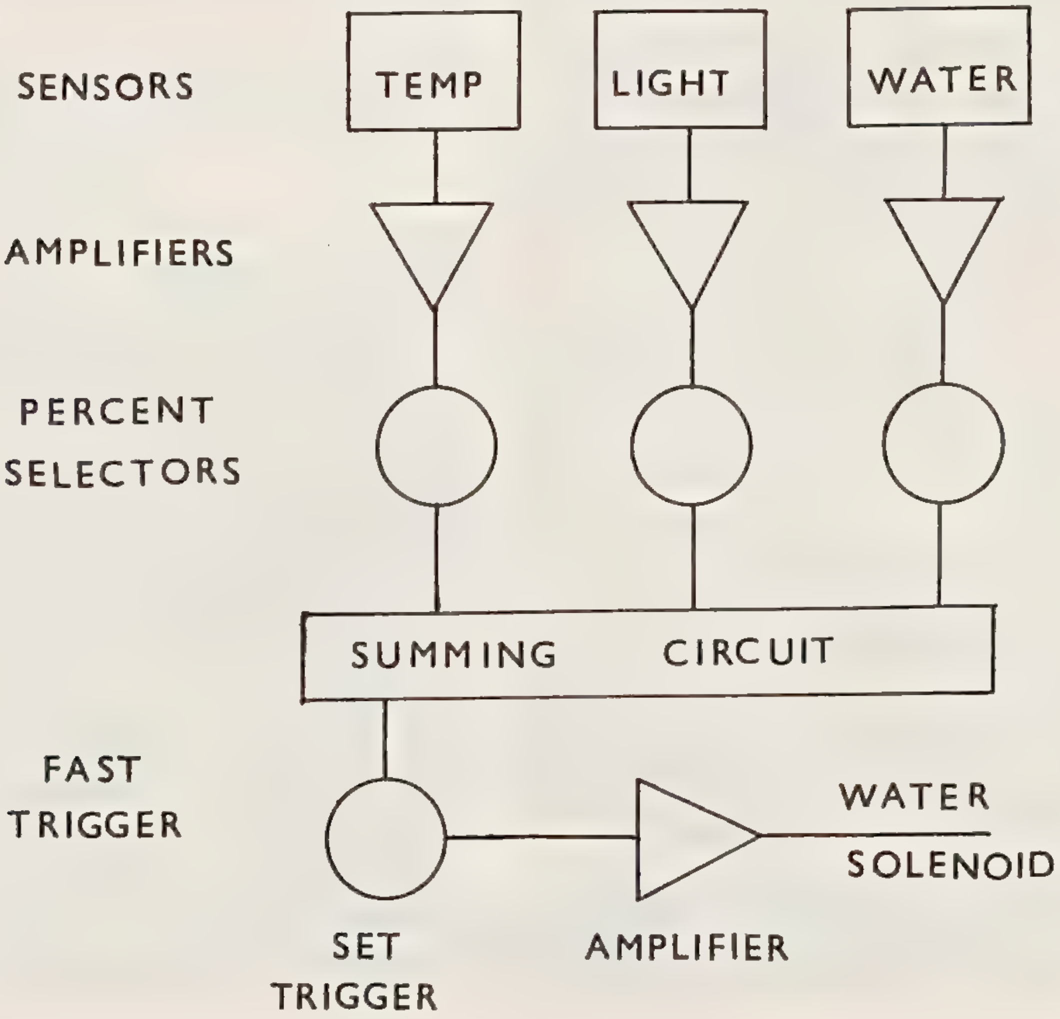
The placement of the water sensor by the grower is used to control the duration of "water on", although this could be done by additional electronic circuitry receiving a pulse when water comes on and holding this "on" condition for a time period selectable by the grower. However, a more economical method is to allow the grower to position the water sensor to receive very little water which provides for long-time watering. Conversely, if the sensor is placed in a wet situation the watering time will be curtailed. It is also interesting to note that the water sensor seems to respond to the humidity of the glasshouse. In winter, at say 3 pm the output from the watering circuit is reasonably high, (low light intensity prevents watering from occurring) and as the temperature falls during the evening, so bringing about an increase in relative humidity, the water sensor detects this and indicates, on a meter, that wetness has increased. This extra "wetness" can only come from the humid atmosphere. This condition persists throughout the night and, in the morning, the wetness of the water sensor, produced by the humidity, itself prevents early morning watering.

The foregoing is a description of a simple equipment where three factors contribute to cause a desired action; watering. The use of electronic circuits has enabled these three factors not only to be integrated which itself is a worthwhile accomplishment but also it permits this integration to be done in any desired proportion of each factor and allows immediate change of these proportions. It would not be easy to do all of this by any other means.

There is little doubt that the future will see a much greater demand for this type of control among private glasshouse owners. The rapid increase in sophistication of electronic devices and their reduction in price, will probably make the equipment described above comparable with a 1908 automobile in relation to the motor car of today.

References

Evans R.D. American Orchid Society Bulletin, March 1961.
Gould-Adams The Garden, October 1975.



VICTORIAN GROUP'S FIRST TEN YEARS
(John Fanning, President ANOS (Vic.) looks back)

I thought it would be easy to write a resume of our Group's history — wrong. What a bore! I had to read every Bulletin and while I, a Foundation Member, found much of interest in the personalities portrayed I found this impossible to transfer to paper. It was amusing to read the conflicting comments on the cultivatability of various species and to note how the approach to difficult species has changed over the years. Milestones in our growth have been scarce so such a review is mostly a chronicle of steady expansion.

It all started when a Mr Les Raynes wrote to all known native orchid growers suggesting the formation of a Group of A.N.O.S. With the able assistance of Bill Murdoch a meeting was arranged in a room at the Victorian Railways Institute. Twenty-five people turned up and the Vic. Group was born with fifteen financial members and an incomplete Committee. Eleven of those fifteen are still members. Les Raynes was elected first President and membership fee was set at $2.00 plus A.N.O.S. membership fees. This latter was later dropped and now our fees are $4.00 (single) — not bad after ten years. Our membership fluctuates around 90 — 100 with members all over Australia and as far afield as New Zealand, America and England.

Subject matter for our meeting-night lectures has ranged through seed-raising, art, photography, travel and occasionally orchids. In one very low moment we even opened our doors once to exotic species and the Gods showed their displeasure by arranging a power strike. We have not dared to repeat the experiment.

Our members have been involved in the revision of Nicholls's Orchids of Australia, a checklist of then-known Australian orchid species, two booklets, one slide lecture, the reconstitution of an area to pre-white-man vegetation and a terrestrial tuber distribution scheme which has in seven years handled about four thousand tubers. Several of our members, on the Group's behalf met Prince Phillip at a Governor's Garden Party. Our services were even called in to assist in a freeway environmental impact study. Our latest effort is the Terrestrial Study Group whose charter is to look into our terrestrials somewhat further than just cultivation, e.g. distribution surveys, life cycle studies, taxonomy etc.

Socially we have had much fun with outings, barbecues and orchid hunts and we now look forward to see what the next ten years will bring.

ANOTHER LETTER TO THE EDITOR from Bill Murdoch, 30 Robey Road, Coal Point. 2283.

It is an annual pilgrimage for me to visit Melbourne. On this occasion, something special, the tenth birthday of the ANOS Victorian Group. As it was known among my friends that my birthday was imminent it turned out to be a combined affair to cut the birthday cake, and to blow out the candles, accompanied, of course, with musical honors. I know this sounds very simple, and so it was until I attempted to blow out the candles. Have you met the candles that promptly relight themselves ?

As is usual, I stayed with Alan and Jean Home. Hosts of the most sincere kind. A programme was arranged, and I was taken from one friend to another, to enjoy some of the best cultural efforts I have seen. At David Cannon's, some really fine hybrids, which in some way reproaches my philosophy. Hybrids, yes for those who want them, but not at the expense of species. However David's were very worthy plants.

John Fanning, (of the bulb bank, a continuing and valuable project), Barrie and Helen Richards, (Helen is the Editor, and does an admirable job.) and naturally, David L. Jones. Incidentally, David is preparing to move to Currumbin, where he proposes to open a nursery. A loss to Melbourne, but we wish him well.

The highlight of my visit was to call on Gerald McCraith. Undoubtedly one of the personalities in the Orchid World. Orchid Council, Victorian Orchid Club, Foundation member of ANOS, and in more recent times, the guiding spirit of The Australian Orchid Foundation. Orchids in abundance that I had never seen before, and his growing techniques were interesting. Gerald uses Bordeaux mixture for his all-purpose spray. Originating in the district of that name (in France), it is extensively used in vineyards. It took me back more than sixty years, when I used to mix it by the barrel — for tomato growing. Simple to make, cheap, efficient for all purposes including slugs and snails. Ingredients — bluestone (copper sulphate) and slacked lime.

Small branches of English Oak *(Quercus* - sp.) are used for mounting epiphytes. The bark, and the wood is very long lasting, and the surface ideal for the plants.

Thirdly, for me the most important: Gerald's method in growing on his plantlets after deflasking: a plastic bag of ample size, say 24 x 12 inches some spaghnum moss in the bottom; an icecream container with suitable compost, and surfaced with more spaghnum. The plantlets are inserted into the surface, the bag inflated, tied at the top, and hung in a warm place, but not in sunlight.

SYDNEY GROUP

Sydney Group's annual general meeting will be held in conjunction with its October monthly meeting (second Friday in the month). This will be a key meeting for this Group not only because a new committee will be elected but also because of the new venue for monthly meetings. **The October meeting (and all subsequent meetings) will be held at the Ryde School of Horticulture, 59 Parkes Street, West Ryde at 8 p.m.** Sydney members will find this infinitely more convenient than the old city location. The excellent facilities of the Ryde School of Horticulture are well known — ample parking, spacious meeting rooms, visual aids — all that you could ask for.

This Group is obviously expanding its membership and widening its horizons. Members of ANOS who live anywhere in Sydney cannot fail to profit by joining this active friendly Group if only to see the benching of plants in October. The plant auctions from time to time will justify your joining. Don't hold back because it is the A.G.M. You don't have to join the committee, but if you do your experience in orchid collecting, growing and general knowledge will be accelerated.

Contact Jim Walker now (see Who's Who for details).

Prasophyllum goldsackii J.Z. Weber & R. Bates

A New Species of Prasophyllum from South Australia

Published in the Journal of the Adelaide Bot. Gardens 1(3): 167-170(1978)

by R. Bates

Herb terrestrial, 10-30 cm high, glabrous, arising from a globose tuber; the base of stem invested in fibrous sheaths. *Leaf* longer than raceme, narrow, conduplicate, 1-2 mm wide, green, sheathing above the middle of the stem. Raceme loose, 5-12 flowered, *flowers* shortly stalked, subtended by ovate, acute bracts about 2 mm long and wide, spreading, dark-purple, cleistogamous; *ovary* green, short, turgid, 4-7 mm long and 2-3 mm wide. Dorsal *sepal* ovate, acute, hooded, decurved apically, 3-4 mm long and 2.5 mm wide, green, purple towards apex; lateral sepals eventually free, 4-5 mm long and c. 1.5 mm wide, falcate, incurved, green with purple central stripe and apex. *Petals* triangular, acute, c. 3 mm long and c. 1.5 mm wide, green and purple towards apex, sometimes completely hidden by sepals. *Labellum* triangular, subacute, c. 4 mm long and 1.5-2 mm wide at the base, recurved and keeled distally with inflexed apex, green with pale prune-coloured edges and apex; callusplate green, concave at base, increasingly thickened and convex distally, terminating as two prominent ridges in the bend of labellum, margins entire, slightly undulate. *Column* short, erect, c. 1.7 mm long and c. 1.5 mm wide; appendages erect, lanceolate with obtuse tips. shorter than rostellum, basally adnate to stigmatic plate; stigma obcordate; anther triangular, c. 1.2 mm long, *pollinia* two, granular and friable, easily removed; caudicle short. Seed small, oblong, c. 0.2 x 0.1 mm, numerous, cream-white.

Prasophyllum goldsackii, of the section Euprasophyllum, is described from Eyre and Yorke Peninsulas, South Australia where it occurs in terra rossa limestone country, in stunted mallee heathland with mean annual rainfall of 350-450 mm. Indications are that it was reasonably abundant in such country on Yorke Peninsula before settlement. It has presumably been overlooked by most collectors because the flowers do not expand and appear withered even in bud. (The flower in the illustration was opened manually.)

It is the authors' opinion that *P. goldsackii* represents a cleistogamous 'dead end' offshoot in the evolutionary development of the polymorphic *F. fitzgeraldii* R.S. Rogers & Maiden, from which it differs in its distinct labellum, triangular petals and withered appearance. *P. goldsackii* has no apparent fragrance whereas the insect-pollinated *P. fitzgeraldii* is delightfully perfumed.

P. goldsackii is not usually associated with *P. fitzgeraldii* in the field even though the latter species does occur in several forms on both Eyre and Yorke Peninsulas. Other orchid species usually found with *P. goldsackii* include *Thelymitra canaliculata, Pterostylis mutica and Caladenia filamentosa var. bicalliata,* all of which prefer the comparatively bare ground which *P. goldsackii* favours.

The type specimen of *P. goldsackii* was collected at Corny Point on Yorke Peninsula (10.10.54) by Mr Harold Goldsack in whose honour the species is named. It was Mr Goldsack who first recognised it as a distinct taxon and proposed that it should be described as a new species. Harold Goldsack had a long association with Dr R.S. Rogers during the late twenties and thirties. He is well known in S.A. for his contributions to the field of orchid study, notably for his paper 'Orchids of the National Parks & Reserves', for many years a standard reference on S.A. orchids. Mr Goldsack is a member of the S.A. group of ANOS (Native Orchid Society of South Australia).

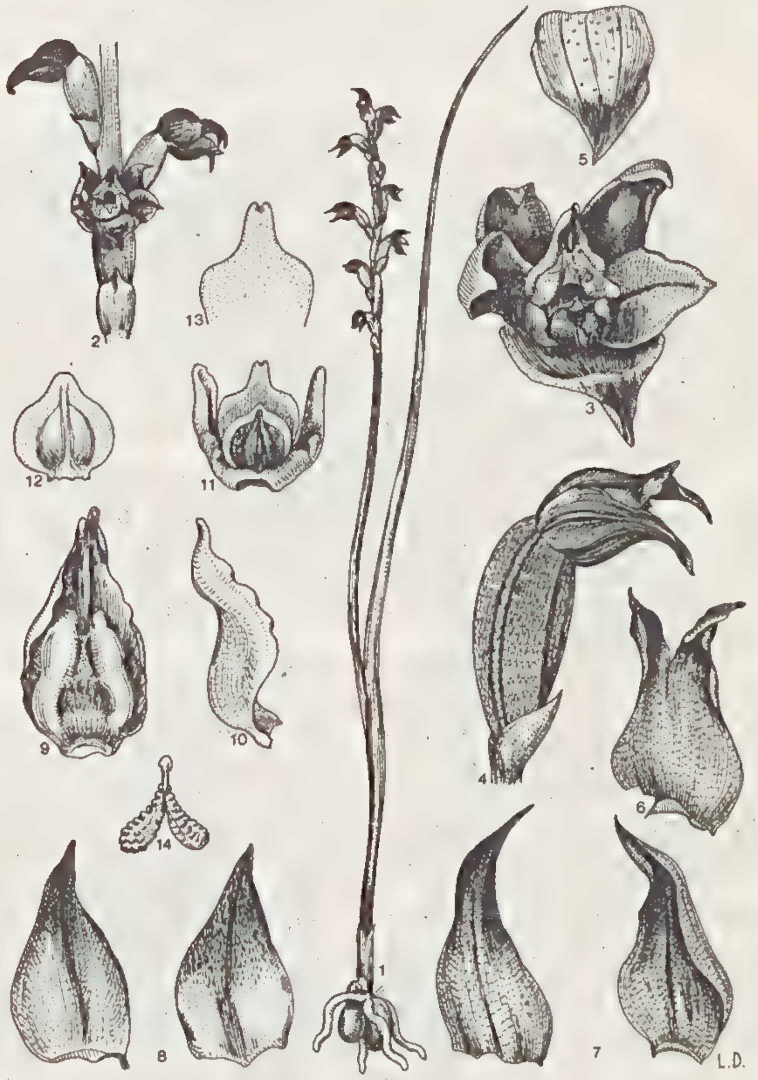


Fig. 1. *Prasophyllum goldsackii,* 2. inflorescence; 3. flower from the front; 4. flower from side; 5. dorsal sepal; 6. lateral sepals connate; 7. lateral sepals free; 8. petals; 9. labellum from the top showing callus-plates 10. labellum from side; 11. column from front showing appendages; 12. anther; 13. stigma and rostellum; 14. pollinia with caudicle; (drawings made from cultivated specimen originating from Yorke Peninsula.)

ANOS ANNUAL GENERAL MEETING

New office bearers on ANOS Council for 1978–1979 were appointed at the A.G.M. on 2.9.78. They are listed under "Who's Who" on page 23 of this issue. The new President is Mr Jim Walker who is also President of the Sydney Group. Mrs Mollie Shelley, another new councillor, takes office as Assistant Secretary. There were three resignations from the former Council: Messrs M.J. Corrigan, R. Lowe and G. Wells. Fortunately all will continue their support of ANOS activities as limitation on their time permits. There is one vacancy to be filled but the new Council envisages no problem in filling this at an early date. The following Election Officers were appointed for 1978–9: Messrs C. Fourro, F. Martin and G. Wells.

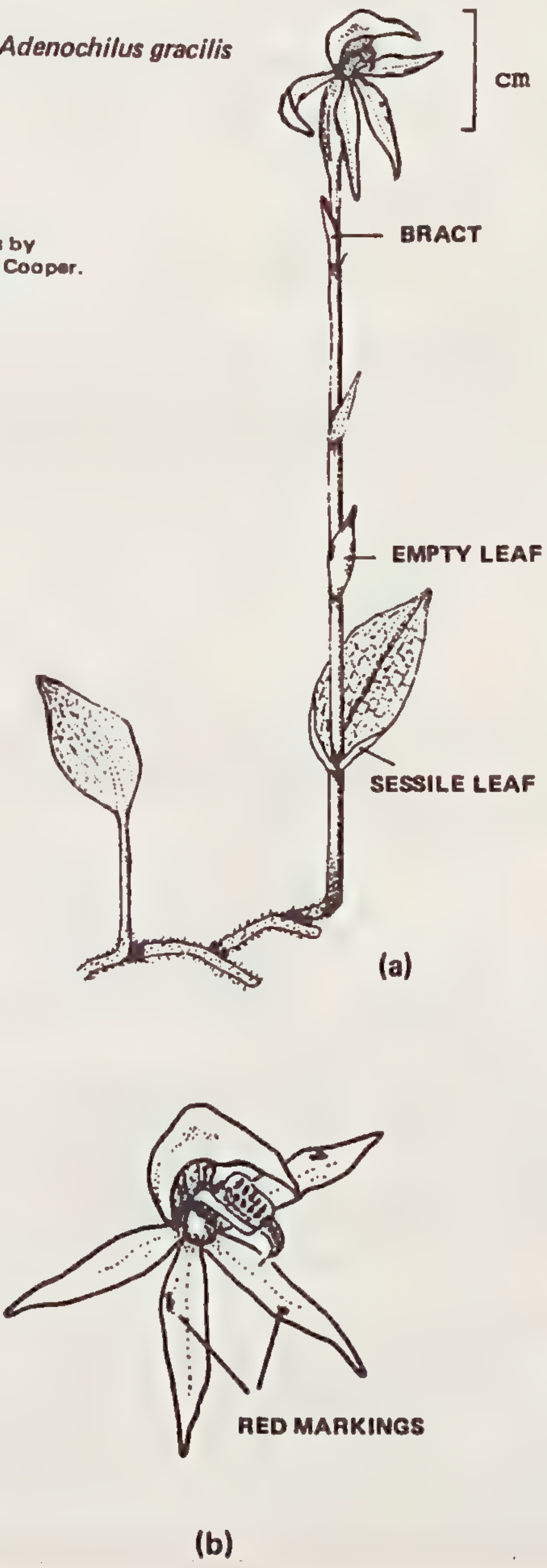
Native Orchids of New Zealand, I - *Adenochilus gracilis* Hook.f.

by Dorothy Cooper

(With acknowledgement to the Journal of the Wellington Orchid Society, Vol.1 No.7)

On a two-week visit to Cobb Valley, North-west Nelson, during January 1978, we were amazed at the number and variety of terrestrial native orchids to be found in flower. Whether this year is a good flowering year or whether our ground orchids always occur in such profusion here I will check during future visits. On past trips one could not fail to notice the clay banks covered with *Microtis* and *Thelymitra* and even *Pterostylis* but some of the others found this year were a little more inconspicuous although, if you were looking for them, they were easily found.

Fig. 1. *Adenochilus gracilis*



Drawings by Dorothy Cooper.

As my husband is mapping the geology of the area there was ample opportunity for me to study the orchids and the first two days of our stay resulted in six different species being found, all within 100 metres of our bush hut. By the end of the two weeks fifteen species had been discovered. Although most of our time was spent in beech forest at approximately 1000 metres no epiphytic (tree) orchids were found and we have had long discussions over whether it is too dry in the Cobb Valley or too cold. There was snow on the top of Mt Peel, just under 2000 metres and there is a general lack of epiphytes on the beech trees in the Cobb area.

The flowering time of most of these terrestrial orchids seems to be of relatively short duration and if they had not been photographed as they were found our next visit a few days later would have been too late as we often found that the flowers had closed, stalks were elongating and capsules were developing.

I was armed with "Flora of New Zealand" Vol.11, in which Lucy B. Moore and Elizabeth Edgar describe the Orchidaceae. After two weeks when I had found ten of the 21 New Zealand genera (represented by 15 species) I was well pleased with my efforts as some are not found as far south as North-West Nelson, 4 are epiphytes and do not occur in the area, while others would obviously have a different flowering time.

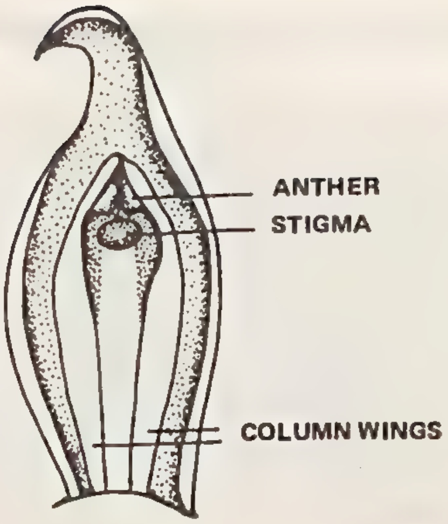
The flowering period of all but one species found occurred during the two weeks from 5th to 19th January. One, *Corybas trilobus,* was not found in flower although we had picnic lunches sitting on carpets of its leaves, a few immature capsules were found and from their development I would imagine they were in flower during early December. By varying our holiday time by a few weeks I hope to extend our 'finds' next year.

One 'odd' thing we noticed was that many of the species found were growing beneath secondary growth around cleared areas where roads and the Cobb Hydro Dam had been constructed, rather than in primary forest. Most seem to prefer semi-shade but some occur on seemingly dry banks, gravel roads and even scree outcrops with little other vegetation around. *Corybas macranthus* with its weird flowers was always in dark damp places, and *Gastrodia sesamoides* found beneath mature beech trees was also fairly shaded adding to the problem of photography. *Pterostylis* and *Chiloglottis* occurred in a wide range of habitats. Over the next few issues of the Orchadian I hope to show just what some of our terrestrial natives orchids look like.

Amongst those we found, the one occurring first in the classification used in "Flora of New Zealand" Vol.11, Moore and Edgar, is *Adenochilus*. (*aden* Greek for gland, and *Kheilos,* a lip, referring to the structure on the labellum).

Adenochilus gracilis (See Figure 1) is endemic to New Zealand although there is an Australian species of the genus *A. nortonii.* The solitary broad pointed leaf, 1.5cm long by 0.75cm wide, makes this native easy to identify, and apart from the plants seen in flower, the leaf was often recognised amongst the moss. This orchid often occurs alone, sometimes in groups of a few, or occasionally in rather spread out colonies, it is peculair in that is has no underground tuber, and its branching hairy rhizomes with constricted nodes at about 2cm intervals must spread for some distance – often at least 60cm before sending up another shoot. The flower is tiny but with its galea or hood arched over forwards and its lateral petals held out sideways its solitary whitish-green form is quite easy to see although it blends well with its surroundings. We found it in dry moss beneath beech trees at 1000 metres. The shiny green leaf is stalked when not in flower, but sessile, that is without a stalk, when it is found about 1.5cm up the flowering stem. The stem in our specimens is 8–10cm high and very thin, topped by the 1.5cm high flower. Spaced up the stem beyond this leaf, is first an empty leaf, then a leaf-like bract and finally a bract, the ovary elongates markedly as the flower matures. The dorsal sepal which is joined to the column near its base is green while the lateral sepals and the slightly narrower and smaller petals are a pale creamy green. The lip is not very long, about half the length of the hood which arches over it. The broad part at the back is nearly erect with a mass of yellow calli or outgrowths on it. The central portion is flatter with 10 white upright glands and lateral red stripes, while the anterior portion is deflexed into a long apical point from the midlobe with prominent yellow calli in longitudinal rows down the centre to its tip. Red markings also occur on the column wings and to a lesser extent on the sepals and petals. The lateral wings extend down the column for its entire length and form hooked lobes above the anther at the top where it curves forward. There is a fairly prominent stigmoid lump facing downwards on the curve of the column immediately below the anther. (See Fig. 1, a–e.)

Our finds differed from that described in 'Flora' in that the column was pale green not reddish, while its membranous wings were quite markedly reddish. 'Flora' states that the flowering stem is from 5–20cm tall and occasionally two flowers develop. It is found from Coromandel Peninsula southwards. Flowering time in the Cobb Valley was from the beginning to 10th January.



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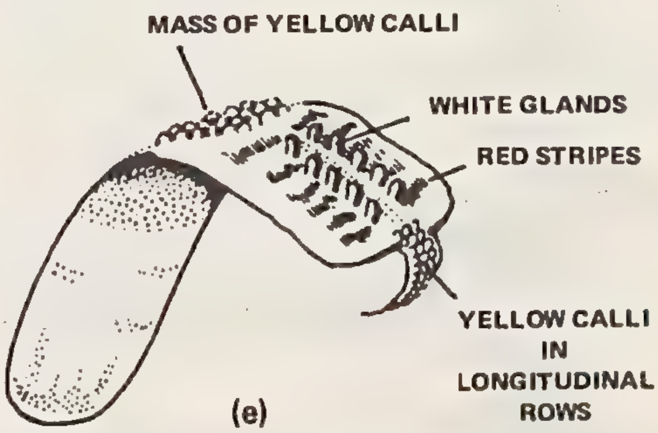
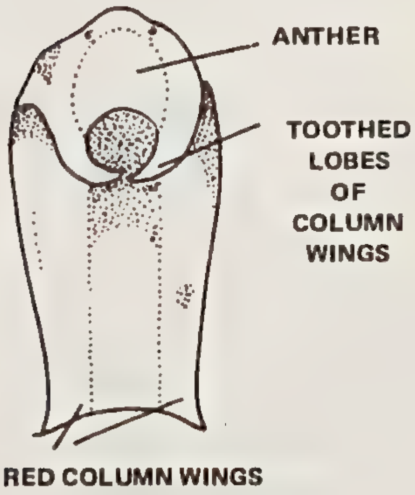


(e)

a) Showing flowering specimen, stalked non-flowering leaf, and hairy rhizome
b) enlargement of flower;
c) column from above;
d) underside of column and dorsal sepal;
e) labellum flattened to show structure.



(c)

Editorial note on the Genus *Adenochilus* Hook.f.

It seems specially appropriate that Dorothy Cooper's first article for the *Orchadian* should deal with this genus. It consists of but two species: *A. gracilis* Hook.f. (described by J.D. Hooker in 1855 in *Flora Novae Zealandiae)* and *A. nortonii* FitzG. (described by R.D. FitzGerald in 1876 in *Australian Orchids* – see reproduction of his drawing and description in *Orchadian,* Vol.5 No.4 opp.p.47). To quote from FitzGerald *"The discovery of this genus is peculiarly interesting, as still further uniting the Orchids of Australia and New Zealand, the genera of which, though almost identical, hardly include a single species in common: a union and divergence that may be well explained on the supposition that these countries, once united, have been so long separated that the species are no longer identical, though the genera are unaltered".*

FitzGerald's pleasure in describing *A. nortonii* is apparent from the language he uses in his introductory comments (same reference in *Orchadian). "Could it be actually understood how great a pleasure can be obtained in the finding such a little plant in such a situation, surely Botany would enrol more votaries."*

THE AUSTRALIAN ORCHID FOUNDATION SEED BANK

The A.O.F. is charged with action to preserve the orchid species with particular attention to Australian species. As part of its programme it has established a seed bank. The A.O.F. hopes that the seed bank will make an important contribution to the preservation and propagation of endangered Australian species (and there are many endangered). To serve its purpose, the bank needs seeds. If you are able to provide seed, either selfed or naturally pollinated, your donation to the seed bank will be most welcome. This seed is distributed to interested growers (with nominal charge to cover administration costs). Your help will be appreciated. Please direct all enquiries to L.J. Lawler, c/- Department of Biochemistry, University of Sydney, Sydney, N.S.W. 2006. Telephone 848 9150 after hours.

Australian Species

Caladenia carnea
" *dilatata*
" *graminifolia*
" *lobata*
" *roeii*
Cymbidium canaliculatum
" " *"greenform"*
" *madidum*
Cryptostylis ovata
Dendrobium aemulum
" *antennatum*
" *bigibbum*
" " *"white spot"*
" *canaliculatum "pink form"* (A.O.R. March 1977)
" *dicuphum*
" *kingianum*
" *linguiforme*
" *lobbii*
" *speciosum*
" *speciosum v. hillii*
" *teretifolium v. teretifolium*
" *teretifolium*
Diuris laxiflora
" *maculata*
" *palachila*
" *palustris*
" *brevifolia*
" *laxiflora*
" *pedunculata*
Eulophia pulchra
Habenaria ochroleuca
Phaius tancarvilliae
" *curta*
" *nana* (W.A.)
" *nutans*
" *pedunculata*
" *recurva*
" *scabra v. scabra*
Sarcochilus australis
" *fitzgeraldii*
" *hartmannii "alba"*
Thelymitra antennifera
" *cyanea*
" *fuscolutea*
" *longifolia*
" *luteocilum*
" *pauciflora* (blue)
" *pauciflora* (white)
" *rubra*
Vanda hindsii

Further Light on *Thelymitra truncata* Rogers

— by R. Bates

D.K. McAlpine's excellent article in the June, 1978 issue of the *Orchadian,* titled "On the Status of *Thelymitra truncata* Rogers" has prompted the following notes:-

1) In Part 1 of Black's "Flora of South Australia" (3rd Edition 1978) *T. truncata* is treated as a synonym of *T. decora* Cheeseman. South Australian material of *T. truncata* identified by Rogers was sent to New Zealand where it was positively identified as *T. decora,* a name pre-dating *T. truncata* and therefore replacing it.

2) *T. decora* has been recognised in S.A. as a hybrid. There are two sheets of *T. decora* in the public reference section of the Adelaide Herbarium. One is labelled by the collector as *T. pauciflora* X *T. ixioides.* This has small flowers with a long truncate midlobe to the column. The second is labelled by the collector as *T. longiflora* X *T. ixioides.* It has large flowers and a short truncate midlobe. This certainly backs up McAlpine's article.

3) In Black's "Flora" (third Edition 1978) the earliest name *Thelymitra longiflora Forst. et Forst. f.* is used as a synonym of *T. nuda R. Br. T. megcalyptra* FitzG.; *T. aristata var. megcalyptra* (FitzG.) Nicholls ex Black and *T. aristata* non Lindl, sensu J.M. Black.

4) McAlpine suggests that *T. aristata* is a likely parent of *T. truncata* Rogers; it should be pointed out that he is referring to *T. aristata* sensu Nicholls and not to *T. aristata* Lindl.

5) All three parents, *T. longiflora, T. pauciflora* and *T. ixioides* are common in N.Z. from where *T. decora* is described; however there is evidence to suggest that *T. decora* has become a self-perpetuating species to N.Z.

6) McAlpine suggests that *Thelymitra ixioides forma merranae* (W.H. Nicholls) W.H. Nicholls is the result of back-crossing between *T. decora* (truncata Rogers) and *T. ixioides.* D.L. Jones in the *ORCHADIAN* of December 1976 suggests that it is hardly worth retaining *T. ixioides forma merranae* as a distinct entity. Both suggestions have their merits but I would point out that in November 1977 I investigated a small Mt. Lofty Ranges (S.A.) swamp which contained about 100 plants of *T. ixioides forma merranae* and they were constant in form. There was no evidence of *T. ixioides* of the type form or of *T. paucilfora* occurring in the swamp, indicating that this population of *T. ixioides forma merranae* was self-perpetuating.

Further Light on the Saprophytic leafless *Calochilus campestris* R.Br.

In contrast to previous articles in the *ORCHADIAN* describing how the saprophytic leafless form of *Calochilus campestris* R. Br. i.e. *C. herbaceus* (syn. *C. saprophyticus)* is usually found in very wet locations, I would mention that most South Australian collections of *C. herbaceus* have been from very dry situations. I have collected it myself from a dry limestone ridge in 300mm. rainfall country.

ANOS SPRING SHOW AT MONA VALE

The Fourth Annual Show repeated and even improved in some ways on its earlier successes in spite of late flowering of native orchids in Sydney this year. This exclusively "native" show still filled the large community hall with high quality orchids, and showed that Australian native orchids, under the capable marshalling of Norm Hilliger and Bob Lowe, always attracts and fascinates the general public. We shall publish a review of the most notable exhibits in the December issue.

Letters to the Editor

Dear Sir,

No doubt you have been inundated with "unbiassed opinions" so plaintively requested in your editorial ! You've excelled yourself in the June issue. As a newcomer in the orchid fraternity, "Smiley-Eye's complaint" really broke me up. I've made just such inane remarks myself, in the early stages.

I can't say enough in praise of Ted Gregory. His article on "Dellies" as he affectionately calls these little charmers was very enlightening. I have just recently acquired Den. "Kestevenii", "Coloratum", and was quite ignorant of its origins. Ted really arouses interest in all the natives he describes, as he has the happy knack of making pictures with words.

On a winter's day in Tasmania, I am transported to Barrington Tops, knee deep in "dellies" my fingers itching to caress them, and nose a-twitch with their lovely perfume.

It takes a born story-teller like Ted, to manage a feat such as that. The cultural notes are full of snippets, never to be found in any other book I've read.

Natives and species are my first love, although I have many of those "blady-grass orchids", and there's more first class information in the "Orchadian", than any other source. Yes !! We ARE out here, not so vocal as we could be perhaps, but I'm sure there are many like me, spending a happy hour or two nose buried deep in the ORCHADIAN in quiet anticipation of spring bursting out all over.

Floriferously yours,

R.D. 793, Kindred, Tas. 7310. Gwen Smith.

(So Ted Gregory has awakened a kindred spirit as I predicted in the March issue, p.170 — Editor.)

* * * * * * *

Selective Breeding of *Dendrobium kingianum*

Dear Sir,

I was pleased to read Ted Gregory's recent article on selective breeding of *Dendrobium Kingianum* (Vol.5 No.11). In it was mentioned a cross between two forms of *D. kingianum* "album" which yielded a high proportion of pinks. Although Ted was disappointed with this result, I find it interesting and it corresponds with a recent discussion I had with Walter Upton who has found that one of his clones of *D. kingianum* "album" gave pink forms of D. Bardo Rose when crossed with *D. falcorostrum.* This anomaly suggests a nomenclature problem with white forms of *D. kingianum* in the sense that a clone may be an "albino" floristically but not genetically. I would therefore like to propose that those clones which are proven to be albino forms genetically should be given the name *D. kingianum* (albino) as distinct from *D. kingianum* (album). One wonders how many of our "albums" are true "albinos".

The genetic nature of colour in *D. kingianum* is a topic of interest with me. Using Mendel's rules, and accepting two homozygous colours of white (WW) and dark purple-red (RR) where neither colour is dominant, then a cross between two heterozygous (WR) clones would produce 25% RR, 50% WR and 25% WW. If both the "album" forms used by Ted were heterozygous then his ratio of "about 85%" pinks in the progeny may be explained by inclusion of RR forms as "pink" and by accepting a lower survival rate of albino (WW) forms. If one of his parents was a true albino (WW) then only about 50% of the progeny should be pink, with no RR forms resulting. But should Ted's result be fitted to Mendel's rules ?

Departure from Mendel's distributions can occur if the genes for colour are located on the same chromosome. Here a cross between two pinks yields only pinks, except when "crossing over" of the chromosomes provides the occasional albino or dark purple-red form. From my limited observations of *D. kingianum* colonies I suspect that this latter hypothesis accounts for the genetic nature of colour in *D. kingianum. D. kingianum* "silcockii" provides evidence that the colour of the labellum is controlled separately from the petals and sepals and this feature may impart interesting features in hybrids incorporating *D. kingianum* "silcockii".

A recent article by P. Smith and N. Paton (Australian Orchid Review, December '77) discusses the use of leaf phenolic acids as chemical markers for cymbidium floral albinism. *D. kingianum* would appear to be a worthy subject for a similar study, being perhaps simplified by the absence of yellow colours.

Selective breeding of *D. kingianum* and other species will certainly provide interesting and useful information on the genetics of our native orchids and I hope future results will be published in the *Orchadian.*

9 Cyrus Ave, Wahroonga, 2076. Norm Stockton

(We assume that the distinguishing epithets "albino" and "album" are suggested for use in discussing hybridising work and breeding plans and not, for example, in registering new hybrids. Readers may care to take up the question of how proof of the distinction might be established. — Editor.)

* * * * * * *

Questionable Motive of the Dendrobium Beetle ?

Dear Sir,

I have noticed that during the time *Den. speciosum X delicatum* and D. Bardo Rose are making new growth, or at the flowering stage, the dendrobium beetle will "hit" some plants and not touch others. I have one *D. speciosum* that has never been able to make growth at all. I wonder whether there are two kinds of new growth and the beetles kill out only certain growths. On some plants I have never had seed pods. One Bardo Rose I broke up into two pieces and placed them side by side on the bench. I killed 28 beetles on one plant, yet they didn't touch the other plant. On the plant on which I killed the beetles, I left a few dead ones but other beetles took no notice. They apparently had to lay their eggs on that particular plant, and not on its neighbour. This has happened for the past few years and this year the *D. speciosum* that has never been able to establish the new growth I am covering with clear plastic bags to get the new growth to the flowering stage. If others have had this experience I would like to know their ideas on it.

16 Jervis St, Huskisson N.S.W. 2540. A. Richards,

(Any entomologists among us ? The answer could lead to a break-through, perhaps ? — Editor.)

TRADING POST

- WANTED TO BUY: "A Guide to Native Australian Orchids" by Roger Bedford. Write to Mrs. N. Lowe, 98 Rawson Road, Greenacre, N.S.W. 2190.
- Mrs Dorothy T. Woolcock of 36 Townsend Street, Portland Victoria, 3305, has a copy of C. Gray's "Victorian Native Orchids Vol.1" if anyone is still trying to acquire one — also Maynard Pocock's "Ground Orchids of Australia."

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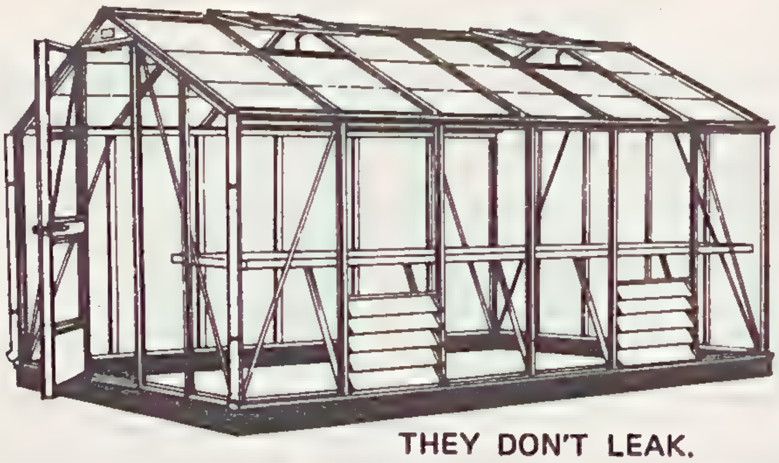

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ANOS Judging Course in Sydney

The first judging course has continued at the high level of efficiency established in the opening session referred to in our June issue. Sessions since that time have included a comprehensive lecture session given by the Registrar of the Judging Panel of the Orchid Society of N.S.W. Mr. B. Cardwell. This was most effective in providing the setting in which the judging of natives must be viewed — i.e., within the general field of judging standards for all genera of orchids. We are indebted to Mr Cardwell and the Orchid Society of N.S.W. for this session.

The following session presented an excellent panel discussion conducted by the four ANOS judges. This was led by Mr Upton in the manner of a true syndicate discussion leader permitting lively participation from the group. He was ably supported by Messrs Corrigan, Lowe and Bradford. A formal paper on the complexity of the application of standards to native orchids was read by Mr Lowe. The fact that this prepared paper was delivered after a very full and free discussion by the panel and the students, and yet seemed to sum up and confirm the findings of the discussion, is a great credit to Mr Lowe's careful preparation of the paper. It was clear from this session that the judging panel — and indeed this first group of trainees — should be vital instruments in the development of standards in the future.

The two sessions held in July included, first, a stimulating lecture by Mr Mark Clements of the Canberra Botanic Gardens on the results of his laboratory research on techniques for growing terrestrial native orchids. In this field Mr Clements has progressed beyond the successful growing of many southern terrestrials into the first stages of dealing with the very difficult problem of growing saprophytes. While not entirely relevant to the judging of our show benched orchids this lecture was of vital concern to those interested in the use of fungi in the medium used for raising difficult terrestrial subjects.

The second session in July dealt with "Hybridising in Australia" (Roger Bedford and Walter Upton). Unfortunately the writer was unable to attend this session, but will eventually have the opportunity of hearing a tape recording of it. Hybrid standards, their development and practical application were dealt with on 6 August by the panel, and this, too, I look forward to hearing on tape. A further report on the Judging Course should be available for the next issue.

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ANOS Group Officers and Affiliated Societies.

NEW SOUTH WALES:

- *Sydney Group:* President: J. Walker (Tel. 419 2529)
  Meets 8 p.m. 2nd Friday each month, Ryde School of Horticulture, 59 Parkes Street, West Ryde.
- *Warringah Group:* President: N. Hilliger (Tel. 99 2468) Meets 8 p.m. 2nd Thursday, Stony Range Flora Reserve, Pittwater Road Dee Why.
- *Newcastle Group:* President: W. Moloney, 11 Crestwood Place, Warners Bay, 2282.
  Meets 4th Wednesday, John Young Community Hall, Thomas Street, Cardiff.
- *Wollongong and District:* Secretary: Mrs.Y. Parkinson, 23 James Road, Corrimal 2518.
  Meets 2nd Tuesday at the Meeting Room of the Wollongong Town Hall.
- *Hastings Valley Group:* Secretary: Mrs. N. Blanch, RMB60, Pappinbarra Road, Beechwood, 2446.
  Meets 7.30 p.m., 4th Friday at Beechwood Methodist Church Hall.
- *Blue Mountains and District Orchid Society (Affiliated):* President: D. Wallace (Tel. 39 2091), Secretary: K. Edwards (Tel. 21 8126)
  Meets 8 p.m. 4th Friday, Red Cross Hall, Springwood.
- *Cumberland Orchid Circle (Affiliated):* Secretary: Mrs D.R. Jones, 121 Cardinal Avenue, West Pennant Hills, 2120. (Tel. 84 3061)
  Meets 4th Wednesday.

VICTORIAN GROUP:

- Secretary: Mrs. R. Wootton, (Tel. 754 6585). Meets 8 p.m. 1st Friday, the National Herbarium, Royal Botanic Gardens, Melbourne.

QUEENSLAND:

- *Darling Downs Group:* Secretary: Dr. N. Grundon (Tel. 35 2570)
  Meets 7.30 p.m. 3rd Friday, Adult Education Centre, City Hall, Ruthven Street Toowoomba.
- *Native Orchid Society of Queensland (Affiliated):* President: R. Unsworth. Secretary: J. Warner, c/o G.P.O. Box 1358 Brisbane, Queensland 4001. Meets 8 p.m. 1st Monday at Bread House, 49 Gregory Terrace, Brisbane.

SOUTH AUSTRALIA:

- *Native Orchid Society of South Australia (Affiliated):* Secretary: E.R. Hargreaves, (Tel. 293 2471 or 297 3724)
  Meets 4th Tuesday, Goodwood Boys' High School, Hardy Street, Goodwood, Adelaide.
- *Northern & Eastern Districts Orchid Society (Affilated):* Secretary: W.G. Joffre Keen, 22 Campbell Street, Oaklands Park, South Australia 5046.

WESTERN AUSTRALIA:

- *W.A. Native Orchid Study and Conservation Group (Inc.) (Affiliated):* Secretary: Ms L. Penny, Unit 6, 63 Fourth Avenue, Mt. Lawley, W.A. 6050. Meets 1st Friday at the Dept. of Agriculture's Film Room, Jarrah Road, South Perth.

NORTHERN TERRITORY:

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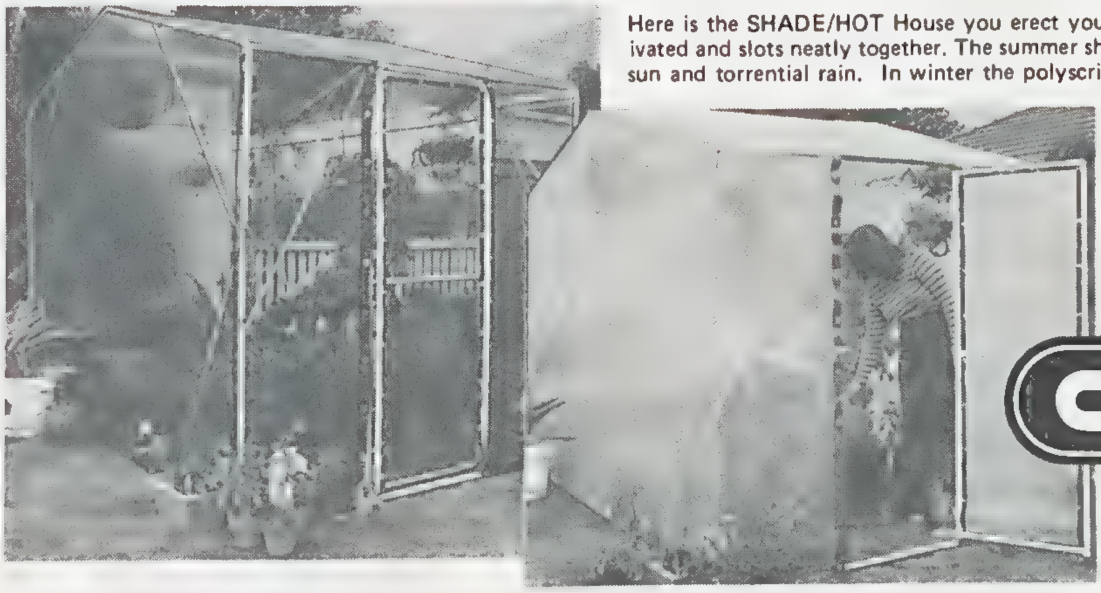

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Journal of the

Australasian
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The Orchadian

Dedicated to the study and care of
Australasian indigenous orchids

Patron: James H. Willis

DECEMBER, 1978.

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Secretary: K. Edwards
Treasurer: P. Collin

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On all editorial and advertising matters please write to: J.J. Betts, 33 Memorial Ave., St. Ives N.S.W. 2075.
Articles should be typed in duplicate preferably on A4 size paper; double spaced with 4cm or more, lefthand margins.

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- W.A. Native Orchid Study & Conservation Group (Inc.)
- Darwin O.S. of N.T.
- Others are listed by States inside back cover.

In general **Group** meetings are concerned with native orchids exclusively.

Affiliates are generally devoted to exotic orchids but have a particularly strong interest in Australasian natives as well.

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THE ORCHADIAN

Founded August, 1963.

Editor: J.J. Betts

Honorary Associate Editors: Dr N.J. Grundon (Qld) Mr J Simmons (S.A.)

Volume 6 December, 1978 No.2

EDITORIAL

This December issue is presented with some satisfaction. The format of the journal is now settled in — with a greater quantity of contents while maintaining the quality and the variety. Concerning the cover design and colour: No, we have not abandoned our blue Thelymitra emblem. The use of *Dendrobium bigibbum* Lindl. in the cover design seemed especially appropriate to this issue — not only to achieve a colour change but also to symbolise the major theme of this issue: a new look at the taxonomy of what is probably Australia's most strikingly beautiful native orchid. The ramifications of S.C. Clemesha's paper should be world-wide if it is accepted. Like the past confusion over the so-called Dendrobium "compactum" (now cleared up by the R.H.S. for both past and future registrations of hybrids) the elimination by Clemesha of *D. phalaenopsis* Fitzg. should also add more hybrids to our list of valid Australian Native Orchid Hybrids for the showbench. Interestingly enough, in this same issue, we eliminate, as a parent in such hybrids, *D. johnsoniae* F. Muell. which began to be a problem for judges about a year ago in Sydney.

Having digested the above, you may turn to "the most beautiful orchid in Papua New Guinea", *D. sophronites* Schltr, by T.M. Reeve of Laiagam, P.N.G. or to Dorothy Cooper's second article on New Zealand's orchids — this time *Corybas macranthus* Reichb.f. of recent fame as a new discovery on Macquarie Island.

If I seem smug about this issue, I hasten to assure readers that I am still not satisfied with the "cultural information" side of our contents. Ted Gregory is the leader in this field, and will, I am sure, continue to be just that; but I cannot believe that Ted is the only first-class grower who is also a writer! **"Were it but the pitifullest infinitesimal fraction of a Product, produce it, in God's name! 'Tis the utmost thou hast in thee: out with it then."** (Carlyle wrote that in *Sartor Resartus* but I pinched it from the recently published *Product,* Later Verses by Robert D. FitzGerald).

FEEDBACK AND FOLLOW-UP

- The Seed Flasks offered by ANOS Council for sale to members are at last coming forward for distribution to the many who ordered them. It appears we underestimated the time for the seedlings to reach the stage for distribution. Next time we advertise flasks it will not be premature.
- The facsimile edition of Volume I of R.D. FitzGerald's "Australian Orchids" offered at a discount price to members of ANOS is still available on application to the Secretary. Owing to the delay in receipt of the *Orchadian* for overseas subscribers (about two months) the offer remains open until further notice. The price per copy of Volume I (limited to 350 numbered copies at $350 each) is $300 to our members. Lansdowne Editions (the publishers) have certified that "no further copies will be printed at any time." Distribution began in the first week of November, 1978.
- **For Xmas,** ANOS Council has planned a B.Y.O. barbecue with the Sydney Group from 11 a.m. on Saturday 9th December at Salvation Creek, Ku-ring-gai Chase. ALL members of ANOS are welcome especially "Far afield" members who happen to be in Sydney at the time. Unfortunately this issue is not guaranteed to reach you before the event. If it does: you cannot miss the signpost on the right-hand side of the road north to West Head.

INTRODUCING THE NEW PRESIDENT OF ANOS COUNCIL

Jim Walker joined ANOS Sydney Group early in 1971 shortly before joining the parent Society. Immediately he joined the Sydney Group he was co-opted as its Secretary/Editor. He has served continuously on the Committee of Sydney Group ever since, holding all Committee positions. In 1977 he was elected President of the Group.

In 1971 he had become Secretary of ANOS Council and held that position for one and a half years. He retired from Council in 1974 to devote more time to his special interest in terrestrial orchids, which he has successfully exhibited from time to time.

Jim passed the first ANOS judging course this year and while doing the course was requested to join ANOS Council once again — this time as President. He brings to this important job not only the valuable experience gained as a former Secretary of ANOS Council but also concern for efficiency in management. He is a chartered accountant by profession and is in charge of his own firm. We give you his introductory message below.

From the New President

The Annual General Meeting of ANOS which saw my election as President for 1978-1979, issued an instruction to the Council to the effect that the constitution be re-written. The defects of the old constitution have been acknowledged for many years; however these defects became most obstructive this year. Accordingly a new draft constitution is being prepared and will be ready for the next Annual General Meeting.

The *Orchadian* has a new format with an elected, as opposed to a *de facto,* editor. I shall ensure that the high standard of the *Orchadian* is maintained and I join the Editor in inviting members who have something to say to "put it in writing".

Future developments will include support for the Sydney Group in establishing a native orchid garden at Taronga Zoological Park. As the site selected is visited by approximately 800,000 visitors each year, including international visitors, the benefits to the Society, Australia-wide are obvious.

Elsewhere in this issue you will see the announcement of the results of the juding course. There are now seven more certificated judges. This will reduce the load on the original "gang of four" considerably. I congratulate those who passed and look forward to presenting them with their certificates.

The lack of recognition that other Societies give ANOS is a problem which has bothered many members. During my term an attempt will be made to correct this situation and achieve for ANOS the respect and acknowledgement it deserves.

Merry Christmas to all members and a succesful New Year.

Jim Walker.

A Review of *Dendrobium bigibbum* Lindl.

by S.C. Clemesha

Synopsis. In this paper *Dendrobium bigibbum* Lindl. ssp. *laratensis* S.C. Clemesha is described as a new subspecies. The status of *D. bigibbum* Lindl. ssp. *bigibbum* var. *superbum* Hort. ex Reichb.f. subvar. *compactum* (C.T. White) Dockrill is accepted and *D. phalaenopsis* R.D. Fitzg. var. *phalaenopsis* is reduced to a synonym of *D. bigibbum* Lindl. ssp. *bigibbum* var. *superbum* Hort. ex Reichb.F. subvar. *superbum*.

A NEW SUBSPECIES OF DENDROBIUM FOR THE TANIMBAR ISLANDS.

Dendrobium bigibbum Lindl. ssp. *laratensis* S.C. Clemesha ssp. nov.

Haec subspecies a typica differt habitu robustiore, floribus majoribus, petalis saepe angustioribus et labelli disco venis clare separatis.

This subspecies differs from the typical one in its more robust habit, its larger flowers, its often narrower petals, its narrower, clearly separated veins of the labellum disc, and in its more variably coloured flowers. Its habitat is over 1,000 kilometres from that of *D. bigibbum* Lindl. ssp. *bigibbum.*

Syn. *D. phalaenopsis* R.D. Fitzg. var *schroederanum* Hort. ex Masters, Gardn. Chron. Ser. 3, 10:641, figs. 89–91 (Nov. 1891); J.D. Hooker, Bot. Mag. t. 4898 (1885) – as *D. phalaenopsis* R.D. Fitzg.; Anon. Gardn. Chron. ser. 3, 28:240, fig. 70 (1900); Kranzl.Pflanzenr. 45:261 (1910); C.T. White, Austr. Orchid Rev. 7:6 (1942); S.T. Blake, Proc. Roy. Soc. Qld. 74, 4 (April 1964). Non Hort. ex Watson, published earlier in November 1891.

Type. Stated to be "N.E. New Guinea" but really the Tanimbar Islands (formerly Timor Laut) and probably the island of Larat, Sander's collector (Micholitz).

When first described *D. phalaenopsis* R.D. Fitzg. var. *schroederanum* Hort. ex Masters was stated to be from "N.E. New Guinea". No orchid closely resembling it has been found in that region to date. Some modern authors have reported it from there e.g., A.D. Hawkes, "Encyclopeadia of Cultivated Orchids", 153 (1965). This error possibly has been ultimately based on the above reference. Very likely N.E. New Guinea was stated to disguise the true habitat of the orchid from rival collectors. The flowers were stated to be variable in colour as the descriptions of the following synonyms indicate.

The protologue includes quotations from a letter from Micholitz and remarks by Sander announcing that the plants had been sent; many were collected from coastal limestone rocks on the beach and on these rocks the natives placed their dead in coffins. The plants were in flower in April, May and June and the year must have been 1891.

Van Steenis-Kruseman, Fl. Males, Ser. 1,1:360 (1950) stated that Micholitz visited Banda (with which limestone rocks do not agree) and Timor Laut at this time.

H.O. Forbes when writing of his sojourn on Timor Laut in "A Naturalist's Wanderings in the Eastern Archipelago", (1885) described (pp. 322–325) the islanders' method of disposing of their dead by placing the corpse in a kind of coffin which was then left on a rock by the margin of the sea. He stated on page 333 that the whole island (of Larat) was composed entirely of coral, and (p. 335) that "growing in the coral crevices often within splash of the waves, I gathered a most lovely orchid, *Dendrobium phalaenopsis,* previously known only from Queensland in Australia". Coral rock is often called limestone so it seems almost certain that Micholitz collected his plants on Larat.

Soon after the plants Micholitz collected were sold, some of them were described as varieties of *D. phalaenopsis* R.D. Fitzg. These varieties were described from plants in cultivation and were based primarily on colour. In most no attempt was made to state their wild origin.

The following can be regarded as synonyms of *D. bigibbum* ssp. *laratensis* as their descriptions include reference to identifying features.

D. phalaenopsis **R.D. Fitzg. var.** *rothschildianum* **Kranzl. Gard. Chron. Ser. 3, 12:668 (1892), Pflanzenr. 45:262 (1910).** Native origin not stated in 1892 but statements in Pflanzenr. indicate it probably was one of the plants Micholitz collected. It was described as having unusually large flowers about 10 cm. wide: it was white, faintly blushed pink with pink side lobes of the labellum and pink lines on the disc. Such a description certainly fits some specimens of *D. bigibbum* ssp. *laratensis*. The writer has not observed such a large flower or one similarly marked in Australian specimens.

D. phalaenopsis **R.D. Fitzg. var.** *schroederanum* **Hort. forma** *rothschildianum* **(Kranzl.) E.C. Cooper, Roy. Hort. Soc. Dict. Gard. 2:653 (1951)** was based on *D. phalaenopsis* R.D. Fitzg. var. *rothschildianum* Kranzl.

D. phalaenopsis **R.D. Fitzg. var.** *album* **Hort. ex Williams, Orchid Grow. Man. Ed. 7:356 (1894)** – wild origin not stated. It was described as "A pure white variety . . . . The flowers are nearly 4 inches (10 cm). across; lip very broad; sepals and petals more rounded than in the type."

Blake l.c. stated *"D. phalaenopsis* var. *album* had large white flowers with pink stripes on the labellum". These are not mentioned in the original description and he appears to have overlooked the statement of "A pure white variety" (and "lip very broad; sepals and petals more rounded than in the type".) Blake l.c. stated of this variety and also the following that "it is very likely that these names also were based on some of the plants sent by Micholitz". In the writer's opinion this statement probably is correct. The large size of *D. phalaenopsis* var. *album* and the "pink stripes on the labellum" if present both are features found in plants of *D. bigibbum* ssp. *laratensis* and are unlikely, in the writer's experience, to be found in Australian specimens. *D. phalaenopsis* R.D. Fitzg. var. *schroederanum* Hort. forma *album* (Hort. ex Williams) Chapman in Nichols. Illustr. Dict. Gard. Century Suppl. 313 (1901) apparently was based on *D. phalaenopsis* var. *album.*

D. phalaenopsis **R.D. Fitzg. var.** *dellense* **Hort. ex Williams, Orchid Gro. Man. Ed. 7:356 (1894)** was described as "A lovely delicate variety, with pale flowers; sepals and petals white at the base, faintly suffused and veined towards the apex with delicate rosy-magenta; lip pale sulphur-yellow at the base, the mid lobe rosy purple veined with magenta-purple, side lobes white. It was first flowered with Baron Sir J.H. Schroder, The Dell, Egham (England). – New Guinea." Such a colour variation as described above is common in cultivated plants of *D. bigibbum* ssp. *laratensis,* usually as *"D. schroederanum* var. bicolor". The reference to the natural habitat as New Guinea indicates it most probably was based on a plant Micholitz collected.

D. phalaenopsis **R.D. Fitzg. var.** *chamberlainianum* **Hort. ex Gardn. Ser. 3, 16:605 (1894)** – Wild origin not stated. Blake l.c. stated this variety "had a very large white flower suffused with light purple with a dark apex to the labellum". The large size and colour pattern both are features of *D. bigibbum* ssp. *laratensis* which seem absent from Australian specimens.

D. phalaenopsis **R.D. Fitzg. var.** *lindeniae* **Hort. ex Lindenia 16:t 768 (1902).** Wild origin not stated. Blake l.c. stated it "was distinguished by its generally pale colour, the ground colour being creamy white with deep red variegation of the middle lobe of the labellum and tips of the petals". As with the two preceding varieties this description is strongly suggestive of plants of D. *bigibbum* ssp. *laratensis* in cultivation as "D. *schroederanum* var. *bicolor*".

The following description also could apply to some specimens of D. *bigibbum* ssp. *laratensis* but it is insufficiently detailed to be sure.

D. phalaenopsis **R.D. Fitzg.** var *albopurpureum* **Hort. ex Gardn. Chron. Ser. 3, 18:396 (1895).** Wild origin not stated. Blake l.c. stated, "This was white with some dark plum coloured markings on the lip".

The dates on which the following varieties of *D. phalaenopsis* R.D. Fitzg. (and also var. *lindeniae)* were published indicate that they possibly could have been based on plants sent by Micholitz but the descriptions lack identifying characteristics and the writer has no further information on them. It is possible that one or more may have originated from Australia and therefore be referable to *D. bigibbum* ssp. *bigibbum.*

D. *phalaenopsis* **R.D. Fitzg. var.** *hololeucum* **Hort. ex. Gardn. Chron. Ser. 3, 18:396, fig. 72 (1895).** Wild origin not stated. This had pure white flowers. Its name has been applied to plants of D. *bigibbum* ssp. *bigibbum* var *superbum* with white flowers.

D. *phalaenopsis* **R.D. Fitzg. var.** *thundersleyense* **Hort. ex Gardn. Chron. Ser. 3, 38:348 (1905).** Wild origin not stated. This was one of the darkest in colour, the flowers being of rich rose-purple, darkest on the lip and middles of the petals.

D. *phalaenopsis* **R.D. Fitzg. var** *splendens* **Hort. ex Gardn. Chron. Ser. 3, 40, suppl. 3 (1906).** This was stated to have "bright magenta rose flowers with white bases to the segments". Wild origin not stated.

Of the last two varieties and also var *lindeniae* Blake l.c. stated that "although the names are of later date it is also possible that they were based on plants collected by Micholitz". This is so but it also is possible that one or more may have come from another source.

D. *bigibbum* ssp. *laratensis* in addition to varying greatly in colour varies greatly in petal and labellum shape. These segments vary from broad and rounded to much narrower and acuminate. In its most extreme form it is much more acuminate than specimens of D. *bigibbum* ssp. *bigibbum* e.g., a specimen figured in Vietch, Manual of Orchidaceous Plants, 1, 68 (1894).

There is a wide area of overlap in the case of specimens with broadly rounded floral segments e.g. in the description of D. *phalaenopsis* R.D. Fitzg. var. *album* Hort. ex Williams l.c.; Holttum Fl. Malaya, 299 (1964) — as "D. *phalaenopsis* var. *Schroederianum"*; Austr. Orchid Rev. 21, 3 (September 1956) — as "D. *bigibbum* var. *Schroederianum"*; Austr. Orchid Rev. 30, 1, (March 1965) — as "Larat". Also specimens with broad floral segments are common in cultivation in the Coffs Harbour (and other) areas.

The habit of D. *bigibbum* ssp. *laratensis* is more robust than that of D. *bigibbum* ssp. *bigibbum* and the flowers are often larger than those of D. *bigibbum* ssp. *bigibbum* — 6 to 10 cm. across compared to 3 to 7 cm. in the case of the latter. Here again there is an area of overlap.

The veins of the labellum disc of the two subspecies differ. Those of D. *bigibbum* ssp. *bigibbum* are thickened and almost touch. Commonly they occur as a continuous plate or band about 3 mm. wide while those of D. *bigibbum* ssp. *laratensis* are distinct and separated by about their own width.

While the flowers of both subspecies vary from dark mauve to white, many plants of D. *bigibbum* ssp. *laratensis* have flowers which are white with varying amounts of mauve shading and veining especially on the petals and labellum — e.g. the descriptions of the synonyms.

Such specimens, in the writer's experience, are not found in D. *bigibbum* ssp. *bigibbum* though its flowers vary greatly in colour from light to dark mauve or rarely white even within the one locality.

Specimens of D. *bigibbum* ssp. *laratensis* which are pure mauve or white are not distinguishable from Australian specimens on the basis of colour.

As there is no clear distinguishing feature between the two subspecies, the writer is of the opinion that specific separation of them is not justified. Their natural habitats are geographically isolated from each other.

The name *"laratensis"* refers to the island of Larat in the Tanimbar Islands where the subspecies was discovered and from which many specimens of it have been collected. Holttum, Fl. Malaya, 1, 298 (1964) stated, "In Java D. *bigibbum* ssp. *laratensis* (as D. *phalaenopsis)* is commonly called 'Larat', because many plants were brought from the island of that name, where they grow in exposed places on limestone cliffs".

The lack of a clearcut distinction between the two subspecies has led to an immense amount of confusion between them. This has existed since 1885 when the Tanimbar Islands taxon was first reported (as *D. phalaenopsis* R.D. Fitzg.).

The confusion has principally been between D. *bigibbum* ssp. *laratensis* and D. *bigibbum* ssp. *bigibbum* var. *superbum* through the free application of the name *D. phalaenopsis* R.D. Fitzg. to both. This is not surprising in view of their similarity.

In cultivation D. *bigibbum* ssp. *laratensis* is generally called D. *phalaenopsis,* D. *schroederanum* and D. *phalaenopsis* var. *schroederanum.* The last mentioned name was first published as D. *phalaenopsis* R.D. Fitzg. var. *schroederanum* Hort. ex Watson, Gard. & Forest 4:521 (4 Nov. 1891). Type: Plants cultivated by Baron Schroeder, Egham, England, imported by Messrs Veitch & Sons who obtained them from the Rev. Mr Macfarlane, a missionary in Northern Australia.

D. schroederanum (Hort. ex Watson) Hort. ex Gentil, Pl. Cult. Serres Jard. Bot. Brux. 73 (1907) was based on it.

If the plants were imported from Australia as Watson definitely stated, then these names are not applicable to D. *bigibbum* ssp. *laratensis.*

D. *phalaenopsis* R.D. Fitzg. var. *schroederanum* Hort. ex Masters was published later than Watson's name. It therefore is illegitimate since it is a later homonym.

D. *bigibbum* ssp. *laratensis* has extensively been used in hybridising as *D. schroederanum, D. phalaenopsis* and various varieties of both. Plants of D. *bigibbum* ssp. *bigibbum* var. *superbum* also have been used under the name *D. phalaenopsis.* The result is that where the name *D. phalaenopsis* was used, in many cases it is not clear which particular orchid was involved.

In the Proceedings of the Royal Society of Queensland Vol. 74, 4 (10th April, 1964) S.T. Blake published a paper on *"Dendrobium bigibbum, Dendrobium phalaenopsis and the Cooktown Orchid"* with a view to establishing the correct name of the last mentioned since in November 1959 The Queensland Parliament had passed an Act declaring that "The Cooktown Orchid *(Dendrobium bigibbum* var. *phalaenopsis)* shall be the Floral Emblem of the State of Queensland".

He concluded that one variable species — *D. bigibbum* Lindl. — was native to Australia and he reduced all known variants of it to synonyms though recognized that horticulturalists may wish to recognize some varieties. He pointed out that *D. bigibbum* Lindl. var. *superbum* Hort. ex Reichb.f. was the correct name for the Cooktown orchid at varietal rank as this fact had been overlooked.

He reduced D. *phalaenopsis* R.D. Fitzg. var. *compactum* C.T. White to a synonym of D. *bigibbum.* He stated that "D. *phalaenopsis* var. *compactum* was based on abbreviated plants with pseudobulbs 7.5 — 12.5 cm. long and racemes with mostly only three large flowers 6.5 cm. wide. This form has been reported only from rock faces on the eastern side of the Macalister Range

N.W. of Cairns, chiefly near the source of Hartley Creek. The dwarfing may be due to habitat and some growers have told me that the psuedobulbs tend to lengthen after extended cultivation. According to St. Cloud the usual height is 12 – 18 cm. Certainly there is considerable variation in colour and white-flowered plants have been found."

Plants in cultivation in the writer's collection produce racemes with 3 to 7 flowers even though at present the largest stems are only 7 cm. high. Mackinney's Nursery at Sunnybank Q'ld. in their 1977-78 catalogue advertised selfed seedlings of this orchid stating "Both parents were very superior forms with over 10 flowers of good shape on the spike". Riverdene Nurseries at Gresford N.S.W. and Sunshine Orchids at Brisbane have sold selfed seedlings of it also. In all cases the seedlings observed by the writer have stems as compact as their parents.

The writer has been able to observe 3 clones of D. *bigibbum* var. *superbum* subvar. *compactum* in cultivation for 6 years, prior to which they had been in cultivation for about 8 years. He has observed another clone for 10 years. When grown under conditions of poor light the stems of the 4 clones observed remained short and stout but less so than in plants grown in good light. However the degree of change is slight and in no way approaches the habit of subvar. *superbum*. Under poor light conditions the plants did not continue to grow well for long. The bulb bases rotted and aerial growths grew from their tops. These maintained their short habit for 3 years before they were removed from the parent plant and placed in better conditions. The writer's experience with the above mentioned clones showed him that plants of subvar. *compactum* entirely lack the ability to produce slender tall stems like those of subvar. *superbum*.

A.W. Dockrill gave *D. phalaenopsis* R.D. Fitzg. var. *compactum* C.T. White a new combination and status as D. *bigibbum* Lindl. var. *superbum* Hort. ex Reichb.f. subvar. *compactum* (C.T. White) Dockrill in Austr. Indig. Orch. 442 (1969). He justified this treatment by stating of D. *bigibbum* var. *superbum*: "This variety is extremely variable, much more so than the relatively stable type variety but two clearly defined groups do occur, distinguished from each other mainly by the form of the stems; the characteristics of each group are transmitted to their progeny, even if these are hybrids".

The writer has not observed any specimens of subvar. *superbum* which approach subvar. *compactum* in habit. D. Liddle of Mareeba in "The Native Orchid Bulletin" published by the Native Orchid Society of Queensland Vol. 7 no. 10 (May 1976) stated: "South of the Laura area the plants are less in size and flower but in this area lithophytic types become more common . . . . The lithophytic forms are stocky plants and have at times been offered as *'compactum'*. These are the plants I feel are most confused with true *'compactum'*. This will elongate if poorly grown whereas *'compactum'* will most likely produce plantlets or die. I have yet to see a plant collected from a clump of *'compactum'* elongate so as to be indistinguishable from any other form of *bigibbum* I have seen.

"I have taken measurements of typical plants in many plant colonies south of Laura and by comparing the length with the diameter of the previous years canes a ratio can be obtained which reduce to the following:

Length of cane : diameter of cane
Epiphytes 35 : 1 to 27 : 1
Lithophytes 20 : 1 to 16 : 1
Compactum 7 : 1 to 2 : 1

"These ratios are intended only as a guide to show the great difference between *compactum* and similar plants from the same (type of) area in size of plant if not flower differences."

Dockrill l.c. states of subvar. *compactum* – "the petals more frequently have a tendency to droop slightly away from the dorsal sepal".

The writer's observations of plants in cultivation support Dockrill's statements and he considers his treatment of it as a subvar. of var. *superbum* to be satisfactory.

Blake's conclusions about subvar. *compactum* appear to the writer to have been drawn from limited fresh or herbarium material and plants which had been in cultivation for a short time.

Blake, l.c., believed that the separation of D. *bigibbum* into 2 varieties was not justified. Dockrill, l.c., supported it as did Liddle, l.c. The present author agrees with this also as the differences between the 2 varieties are comparatively clear-cut except in the areas where their distributions overlap.

When Fitzgerald first described *D. phalaenopsis* he stated: "It is easily distinguished from *D. bigibbum* by the absence of the convex form in the flowers, or recurving of the perianth, of the cluster of white glands or calli on the disc of the labellum, of the emarginate termination to the labellum, and of the drooping carriage of the flowers . . . ". In *Australian Orchids* he cites the same differences. He described the stems as "about 20 inches" (50 cm.) high and the flowers as 2 to 2½ inches (5 to 6.3 cm.) across . . . petals 1 inch broad (2.5 cm.) and the labellum about 1 inch long.

Specimens the writer has studied show that the sizes stated fit plants of *D. bigibbum* var. *superbum* and commonly the differences he states apply except for the more drooping carriage of the flowers. Though specimens of D. *bigibbum* var. *bigibbum* with an emarginate labellum apex are plentiful those without it are also plentiful. This feature is much less frequent in D. *bigibbum* var. *superbum,* e.g., Dockrill Austr. Indig. Orchids 441 fig. B. On page 440 he describes this condition as "rarely almost acuminate, apiculate or emarginate". However, though rare, it is not absent. The first 2 features mentioned by Fitzgerald are fairly reliable features for identification.

Fitzgerald appears to have reached his conclusion about the shapes of D. *bigibbum* and D. *phalaenopsis* after studying one, or very few, clones of each. As presence or absence of an emarginate labellum is a distinguishing feature in some orchids it is not surprising that Fitzgerald used it.

Blake, l.c., stated of D. *phalaenopsis* R.D. Fitzg.: "I have not been able to trace a type, and interpretation must be based on the original account and the account in *Australian Orchids,* published a few months later. These would require the flower to have an acute middle lobe of the labellum and few or obscure calli on its disc (it will be noticed that Fitzgerald described 'A few small dark calli' in the protologue and 'no calli' in Australain Orchids)."

Earlier on the same page Blake stated "J.D. Hooker, Bot. Mag, t. 6817 (May 1885) figured and described a plant collected by H.O. Forbes from Timor Laut (Tanimbar Islands) that he identified with *D. phalaenopsis.* This had a labellum with an acute mid lobe and 'five to seven obscure rough ridges extending half way from the lateral lobes to the tip'."

Because Fitzgerald's and Hooker's plates figure plants with acute labella and comparatively few dark calli Blake concluded that the plant Fitzgerald figured must have been imported from the Tanimbar Islands and therefore that *D. phalaenopsis* R.D. Fitzg. is the correct name for the species from there.

Blake has placed undue emphasis on these acute labella. Fitzgerald described and figured the labella as acute but he did not mention it in the discussion that accompanied the original description and that in *Australian Orchids*. Instead, he stated it differed from *D. bigibbum* in the absence of an "emarginate termination of the labellum". Curiously Blake entirely omitted to mention this stated difference when he quoted the differences Fitzgerald stated. All others are quoted including the relatively unimportant "drooping carriage of the flowers".

Blake appears to have believed that in Australian specimens the petals are consistently broadly rounded to emarginate and the labella have broadly rounded mid lobes and conspicuous calli.

In the Tanimbar Islands plants he appears to have believed that the petals are consistently acute and the labella mid lobes also are this shape while the calli are few and sparse.

In his key in Proc. Roy. Soc. Q. he states: "Petals broadly rounded, sometimes emarginate, mucronate or muticous; sepals acute — apiculate but scarcely acuminate; mid lobe of labellum up to 1-1/3 times as long as wide, sometimes oblate, its apex broadly rounded to subtruncate or emarginate, very shortly apiculate or muticous; veins on disc thickened and contiguous; calli usually very numerous and dense . . . . . . *D. bigibbum."*

"Petals distinctly acuminate; sepals shortly acute or acuminate; mid lobe of labellum — acute or shortly and acutely acuminate; tips of all tepals conduplicate, sometimes curved — oblique when flattened; veins on the disc slender and distant by more than their width; calli commonly small and not dense . . . . . . *D. phalaenopsis."*

In the *Australian Orchid Review* 31, 1, 31, p30 (March 1966) Blake stated: "Because of the stated Australian origin and larger flowers with no white crest, the name *D. phalaenopsis* became used at least in Australia for the Cooktown Orchid in spite of the fact that the labellum of the Cooktown Orchid has abundant conspicuous calli and usually a *very* obtuse middle lobe, while the petals are very bluntly rounded and also sometimes notched, but not acuminate".

On the next page he stated: "The differences between *D. bigibbum* and *D. phalaenopsis* can be summed up as follows:

Dendrobium bigibbum has broadly rounded, sometimes notched petals, sometimes with a tiny point on top; the sepals are acute with a more or less distinct point but they are not acuminate; the mid-lobe of the labellum is broadly rounded to nearly truncate at the end, or slightly notched, sometimes with a very short point, the veins on the disc are thick about touching and the calli are usually very numerous and dense, less so on white flowers . . . . . .

Dendrobium phalaenopsis is the correct name for the species commonly known as *D. schroederanum.* It is not Australian and so far as is known is confined to the Tanimbar Islands (Timor Laut). The petals and sepals are distinctly acuminate, the mid lobe of the labellum is more or less acute or shortly and acutely acuminate (often relatively narrower than in *D. bigibbum)*, and the tips of all sepals are folded along the midvein and sometimes curved; the veins of the disc of the labellum are slender, distant from one another by more than their width and the calli are commonly small and rather sparse."

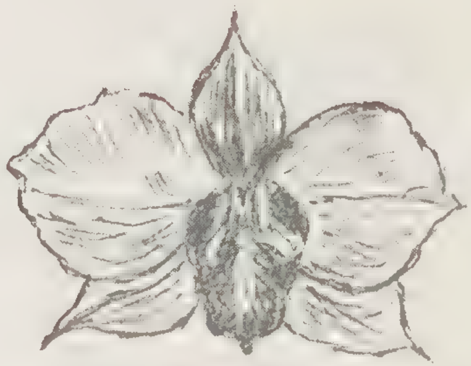
The following references show that the labellum and petal shape of both Australain and Tanimbar Islands plants vary greatly in shape and there is a wide area of overlap. In Australian specimens the labellum calli also vary greatly from "numerous and dense" to "small and rather sparse".

Dockrill, l.c., described the labellum shape of *D. bigibbum* var. *superbum* as "usually oblong but may be almost square or even obovate, truncate, obtuse, acute, or rarely almost acuminate, apiculate or emarginate".

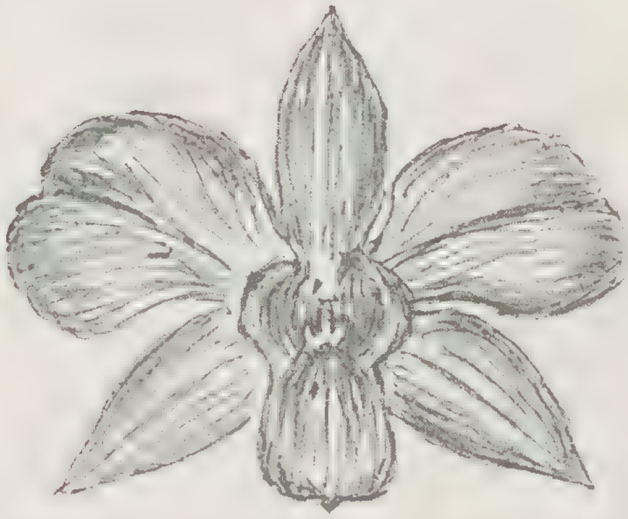
He describes the labellum calli as "3 — 7 but usually 5, creasted fringed or merely rugose". On page 441 he figured 8 variants of *D. bigibbum* var. *superbum.* Specimen "A" has a distinctly acute labellum and much narrower petals than the specimen Fitzgerald's plate depicts. Specimen "H" is almost acute and has a 2mm. apiculate tip. Specimens "A" and "D" have less rounded petals than Fitzgerald's plate.

The *Australain Orchid Review* 31, 1 36 (March, 1969) illustrated and described a series of stamps featuring State floral emblems. The 25c stamp features the Cooktown Orchid. The flower shown has sepals and petals similar to those Fitzgerald depicted. The rather long labellum mid-lobe has a rounded apex which bears an apiculate tip. The writer has observed plants of *D. bigibbum* var. *superbum* which are very similar to it. The writer of the above mentioned article (Mr R. Kerr — the editor) made the following comment about this stamp. "The Cooktown Orchid is part of the *bigibbum* complex which is widely distributed throughout Queensland in its many variations. Artistically the stamp is very well done but care should have been taken to provide the artist with a sample raceme more akin to the type form. Structurally the stamp flower is more like exotic *D. phalaenopsis* than the indigenous *D. bigibbum. D. bigibbum* is widely cultivated all over the world."

W.H. Nicholls, in *Orchids of Australia* 1969 figures *D. bigibbum* var. *bigibbum* (plate 416) and *D. bigibbum* var. *superbum* (plate 417). His plate of the latter shows flowers similar to what Fitzgerald depicted as *D. phalaenopsis.* The sepals and petals are similar though Nicholls's petals are slightly narrower. No two flowers on Nicholls's plate have exactly the same labellum shape but most are more or less rounded with an apiculate point.

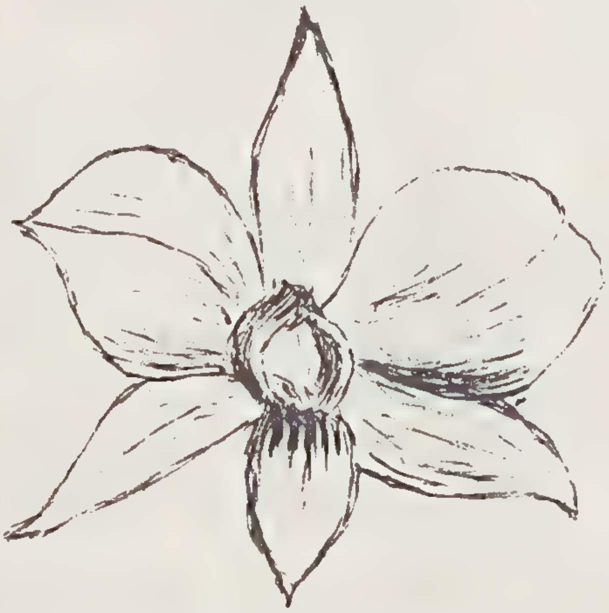


D. bigibbum
From Nicholls Plate 416 (loc. cit.)
(natural size)



D. bigibbum
From Nicholls Plate 417
(natural size)

The writer has observed cultivated plants of *D. bigibbum* var. *superbum* with petals narrower than those in Fitzgerald's plate and in many cases the labellum apex though rounded has an apiculate tip. His observations have shown that apiculate tips are likely to be present on labella which are relatively long and narrow. Generally speaking the longer and narrower the labellum is the longer the apiculate tip is. Dockrill's drawings (l.c.) show this. Both of Nicholls's plates show an apiculate labellum tip. Though Fitzgerald's plate of *D. phalaenopsis* shows flowers with acute labella no apiculate tip is shown clearly. The shape of the labella as depicted and described appears to be a combination of a rounded mid-lobe and apiculate tip. This is most evident in the two top right hand flowers. His failure to show this point clearly appears to have been the main cause of his plate being misunderstood.



D. phalaenopsis
From FitzGerald's plate (actual size);
one of the two top right hand flowers.

It is an error which can happen easily. It is evident also on the labella of some flowers shown in a photograph of a large plant of D. *bigibbum* on the cover of the *Australian Orchid Review* 31, 1 (March 1966). On this some labella are obtuse. Others are of flowers on different angles. In some of these the mid-lobe apex appears to be the same shape as those Fitzgerald shows and no apiculate tip is present. In all the drawings and specimens the writer has studied no labella are exactly like these in plants of either subspecies.

This difficulty is not confined to drawings and photographs. A mid-lobe apex could be described as rounded or acute depending on whether the apiculate tip was included or not. In specimens where it is prominent it would be included but as they range from prominent to non-existent one comes to a dividing point. In Fitzgerald's plate and descriptions it obviously was included.

The lack of an accurate depiction of labellum shape is found in some of Fitzgerald's other plates, e.g., *Dendrobium discolor* Lindl. (as D. *undulatum* R. Br.) and his plate of the *Cadetia* sp. (as *Dendrobium* sp.).

Not only can specimens of *D. bigibbum* ssp. *bigibbum* be found with floral segments similar in shape to Blake's description of Tanimbar Islands plants but plants of *D. bigibbum* ssp. *laratensis* with broadly rounded petals and labella are plentiful in cultivation in the Coffs Harbour district as *D. schroederanum.*

In addition to this, the following descriptions and figures describe or illustrate them.

1. The description of *D. phalaenopsis* var. *album* Hort. ex Williams l.c. — "lip very broad; sepals and petals more rounded than in the type". This variety was treated as a synonym of *D. phalaenopsis* by Blake.

2. On the cover of the *Australian Orchid Review* Vol. 21, 3 (Sept. 1956) as *D. bigibbum* var. *Schroederianum.* The dorsal sepal is more rounded than Fitzgerald's plate. The petals are a bit narrower than those Fitzgerald depicted but they lack the short points. The labellum apex is broad and blunt and has a small apiculate tip.

3. On the cover of the *Australian Orchid Review* 30, 1, (March 1965) eleven orchid stamps are pictured. An Indonesion stamp is labelled "Larat" which is the common name of *D. bigibbum* ssp. *laratensis* in cultivation in Java. The flower shown has broad rounded petals and labellum and even the sepals are broader than most Australian specimens.

4. Holttum, in *Flora of Malaya Vol. 1 Orchids* p.299 (1964), figures a drawing of *D. bigibbum* ssp. *laratensis* as *"Dendrobium phalaenopsis* var. *Schroederianum".* The sepals are shorter and broader than Fitzgerald's plate, the petals are narrower and acute at the apices. The labellum apex is obtuse with an apiculate tip.

From the writer's observations and the references cited the area of overlap in labellum shape is very great and covers most specimens of *D. bigibbum* ssp. *laratensis* and D. *bigibbum* var. *superbum* but the specimen of the former illustrated in Veitch, *Manual of Orchidaceous Plants 1,* 68 (1894) (as *D. phalaenopsis)* lies outside the overlap point. Its floral segments are more acuminate than in any specimen the writer has seen and the petals are rather narrow.

Though there is a broad area of overlap in petal shape between Australian and Tanimbar Islands plants those of the latter often are narrower as the above references show. The petals in Fitzgerald's plate are broadly rounded with an apiculate tip as is common in Australian plants. Certainly the narrow petal characteristic of some Tanimbar Islands plants is not even approached on Fitzgerald's plate.

Blake stated the calli of *D. bigibbum* (i.e. all Australian specimens) are "usually very numerous and dense" while those of Tanimbar Islands plants are "usually small and rather sparse". Dockrill, on the other hand, describes those of *D. bigibbum* var. *superbum* as "3 — 7 but usually 5, crested fringed or merely rugose". In Nicholls's *Orchids of Australia* the labellum throat is stated to be "covered with inconspicuous papillae".

In the specimens of *D. bigibbum* ssp. *laratensis* the writer has examined the calli are "small and rather sparse" and he has no references of otherwise as this rather obscure feature is usually overlooked.

His observations of Australian specimens have shown a great variation from numerous and dense to few and sparse in both varieties. In the typical one the calli are white and stand out from the mauve lamina. When they are sparse and few the exposed ridges are still white and the impression of a white crest is still present. In var. *superbum* the calli vary from numerous and dense to few, small and sparse. They are a similar colour to the lamina though usually darker. Even when they are abundant they are less prominent than the striking white ones of the type variety. One plant in the writer's collection that was collected at the Black Mountains near Cooktown has calli which though numerous are very small and are hard to see. They easily could be overlooked. It is easy to see how Fitzgerald stated "a few small dark calli". His later discription of no calli possibly meant no white calli.

Fitzgerald's plates of *D. bigibbum* and *D. phalaenopsis* show flowers with dark striations on the labella. This feature is common in *D. bigibbum* ssp. *laratensis,* e.g. cultivated specimens — *Austr. Orchid Rev.* 21, 3 (Sept. 1956) l.c. and descriptions of the synonyms. However the writer has not observed it in Australian specimens to the degree that Fitzgerald's plates show. Usually darker veins are present but they are not nearly so clear as the above mentioned plates show.

If these dark striations were present on Fitzgerald's plate of *D. phalaenopsis* only it would be evidence that the plant the plate is based on could have been imported but as it is present also in his plate of *D. bigibbum* it is obvious it is an attempt to show that the labellum main veins are darker. This has been overdone so it creates a false impression. This is understandable considering the circumstances under which Fitzgerald's work was printed and coloured.

A number of his other plates of his new species were not correctly identified for many years or remain a mystery today, e.g., *Diuris tricolor,* D. *sheaffiana,* D. *bracteata, Prasophyllum deaneanum,* P. *transversum,* P. *eriochilum, Corunastylis apostasioides, Sarcochilus eriochilus* and *Cymbidium gomphocarpum.* Some of these at least must not accurately represent the orchid they are meant to.

Blake, *Austr. Orchid Rev.,* stated that in *D. bigibbum* (ssp. *bigibbum)* the veins of the labellum disc are "thick and about touching" and those of D. *bigibbum* ssp. *laratensis* (as D. *phalaenopsis* R.D. Fitzg.) are "slender and distant from one another by more than their width".

The writer's observations of fresh specimens from cultivated plants largely support these statements. Actually in Australian plants the veins are thickened and often are touching forming a thickened plate or band about 3 mm. wide. In *D. bigibbum* ssp. *laratensis* the veins are distinct and separated by about their own width. This difference has not been commented on much as it is not readily observable unless the labellum is removed from the flower or held down. Fitzgerald in the original description of *D. phalaenopsis* described the labellum calli and ridges as "A few small dark calli on the disc of the labellum, which is only slightly ridged at the base". This description of the labellum veins is not clear enough to be of identifying value.

The habit of *D. bigibbum* ssp. *laratensis* is more robust than that of the typical subspecies. A study of plants in cultivation has made it evident that this is true of the plants at all stages of growth from small seedlings to maturity. This is not surprising considering that the Tanimbar plants often grow on exposed rocks near the sea.

Though Fitzgerald in Gardeners' Chronical l.c. stated of *D. phalaenopsis* — it is "only slightly more robust than *D. bigibbum"* (which often is true) — his plate of *D. phalaenopsis* is typical of the Australian subspecies and it is less robust than many specimens of it including his own plate of *D. bigibbum* and both of Nicholls's plates of that species.

D. phalaenopsis R.D. Fitzg. was described in July 1880. It therefore must have been obtained by Broomfield earlier that year at the latest.

H.O. Forbes did not report the Tanimbar Islands plants until 1885 and of them he stated "I gathered a most lovely orchid, *Dendrobium phalaenopsis* previously known only from Queensland in Australia". He was in no doubt that *D. phalaenopsis* was "known only from Queensland".

His error in identification is not surprising considering the similarity between *D. bigibbum* ssp. *laratensis* and D. *bigibbum* ssp. *bigibbum* var. *superbum* and the lack of a clear-cut distinction between the two.

It is hard to credit how Broomfield's plant could have been imported; not only because *D. bigibbum* ssp. *laratensis* had not been discovered in 1880 but because the island of Larat is a small one in a relatively unimportant island group which is rather featureless and flat, has extensive swamps and few harbours. The islands are made up mainly from coral so presumably the waters around them would be dangerous through coral reefs. Certainly much of the over 1,000 km. sea journey to there from Cooktown is through waters which even today are hazardous to shipping because of coral reefs.

D. bigibbum ssp. *laratensis* was unknown in 1880 but *D. bigibbum* ssp. *bigibbum* var. *superbum* was well known. It was described in England (invalidly) in 1876. Veitch l.c. states, "it was discovered by Mr J.G. Veitch in 1865".

Fitzgerald gave "near Cooktown" as the source of *D. phalaenopsis* in the original description, "Northern Queensland" in *Australian Orchids* and in "A Synopsis of Distribution", published later, the locality was stated to be Cairns. Blake (Proc. Roy. Soc.) stated: "The two localities 'near Cooktown' and 'Cairns' can be reconciled when it is realized that in 1880 Cooktown was a thriving port, Cairns was a very new town and port (founded 1876) and Broomfield was a ship's captain. Under the circumstances, Cairns could very well have been 'near Cooktown' to Fitzgerald and most of his readers and he cited it for clarity's sake but gave Cairns as the precise locality in his 'Synopsis of Distribution'."

It is not likely that this is the case as Fitzgerald described another orchid on the same page as his description of *D. phalaenopsis.* It is *Sarcochilus rubricentrum* R.D. Fitzg. (now regarded as a synonym of *S. hartmannii).* Concerning the origin of this plant Fitzgerald stated: "The plant obtained at Cairns Queensland, was flowered in the greenhouse at the Museum by Mr Ramsay, and given to me by that gentleman". Since *Sarcochilus hartmannii* has never been found in North Queensland, the record of Cairns obviously is a mistake. Fitzgerald's later reference of Cairns as the origin of *D. phalaenopsis* probably is an error. Perhaps this mention of Cairns on the same page of *The Gardeners' Chronicle* was accidentally copied. If "near Cooktown" had been stated for clarity's sake in the case of *D. phalaenopsis* then obviously this would have been repeated with *S. rubricentrum.*

Sarcochilus rubricentrum was reported from an area where it is known not to be reasonably possible and this is true also of *Dendrobium stuartii* R.D. Fitzg. of which Fitzgerald stated, "was sent from near Herberton by J.W.R. Stuart, Esq. . . .". Though incorrect, both these localities are in Australia.

Neither of these plants reached Fitzgerald via Broomfield and the writer knows of no evidence that has shown Broomfield to have been unreliable.

Blake, l.c., stated that: "There is no evidence that Broomfield collected his plant from the wild". Fitzgerald in *The Gardeners' Chronicle* stated: "It was obtained near Cooktown, Queensland, and flowers in April". In *Australian Orchids* in the opening of his discussion he stated: "This beautiful Dendrobium has been imported by Captain Broomfield and flowered in his greenhouse", but his closing statement is "it was obtained in Northern Queensland" and also in the same discussion he stated "this finest of the Australian Dendrobs". From these statements it is clear that he did not mean it was imported from another country. Fitzgerald has not used one single word where today the word "collected" would be used. In its place he has used "found", "procured", "obtained" and more occasionally others.

Though "obtained" is commonly used to mean collected, an exception is found under the descriptions of *Caladenia cucullata* R.D. Fitzg. and C. *testacea* R. Br. "The first specimens I obtained were from Dr Ross at Molong".

The exceptions however are greatly outweighed by the number of times it was used meaning collected. The following list shows this. It is not complete and was taken from only a small part of Fitzgerald's work.

(1) In reference to *Dendrobium aemulum* R. Br. "The illustration has been taken from a fine plant obtained on the Bellingen." (2) *Dendrobium discolor* Lindl. forma *broomfieldii:* "I have named it after my friend, Captain Broomfield, who obtained it from Northern Australia." (3) *Dendrobium agrostophyllum:* "Mr Bailey informs me that he has often searched for it, but in vain, having only seen the specimen which he sent me (and which he did not obtain in person)." (4) *Prasophyllum eriochilum:* "I obtained it in flower on Mt. Wilson, in the Blue Mountains (New South Wales) in

November." (5) *"Diuris pallens* has, I believe, been only obtained in New England (New South Wales), where I observed it growing on a wet plain near a hill called 'Ben Lomond'." (7) *Papillilabium beckleri: "Cleisostoma beckleri* would not appear to be generally distributed, as I have only obtained it in Dongay Creek (a tributary of Macleay River)." (8) *Micropera fasciculate* (as *Cleisostoma keffordii):* "was kindly sent to me by my friend, F.M. Bailey FLS, Government Botanist, and was obtained by Mr W.R. Kefford, on the Johnstone River, Queensland". (9) *Pterostylis recurva:* ". . . the only locality where it has I believe been obtained being near the Upper Hay River." (10) *Cryptostylis subulata* (as C. *longifolia)* "On the Blue Mountains I have obtained specimens three and a half feet in height." (11) *Thelymitra crinita* "I obtained specimens near Perth, at Bunbury and Albury." (12) *Thelymitra mucida:* "was obtained in only one locality, Wilson's Inlet". (13) *Diuris sheaffiana* "It was obtained at Forbes, New South Wales." (14) *Diuris platichila* "It was obtained at Woodford, on the Blue Mountains." (15) *Bulbophyllum minutissimum* and *Galeola foliata:* "both obtained at Ballina, on the Richmond River" and "The specimens obtained at the Richmond were found clinging to the branches of a tree, and not on a rock". (16) *"Thelymitra flexuosa* has not I believe, as yet, been obtained in New South Wales."

There can be little doubt that Fitzgerald meant "collected" when he stated "It was obtained near Cooktown" and "It was obtained in Northern Queensland". If he had been unsure of its origin it is likely he would have phrased the statements concerning its origin differently. He did this with *D. stuartii.* "It was sent from near Herberton."

It is obvious also that when Fitzgerald stated that *Sarcochilus rubricentrum* was obtained at Cairns he believed that it had been collected there. Mr Ramsay or the supplier of the plant must have made the error.

There is no logical reason to believe that the source of Broomfield's plant (near Cooktown) was wrongly stated as *D. bigibbum* var. *superbum* was abundant near Cooktown in 1880, hence its common name. Mr and Mrs Waters, two orchid growers who have resided at Cooktown for many years stated in a personal conversation to Mr S. Anderson that "When the Cooktown Orchids were in flower you could easily see them as you drove along the road and you could do this until it was declared the floral emblem of Queensland. After that, commercial collectors took all that were near the road and now you had to go at least 4 miles from the road before you could see any". Another Cooktown resident made a similar statement and yet another stated you could still find them in "the back country" and could see them (when in flower) from "a couple of hundred yards away".

Clearly it would have been very easy for Broomfield to collect a plant near Cooktown or obtain one from someone else who had collected it. As there were shipping links with Cairns it is possible it could have been in cultivation there in 1880 so though its origin from there does not seem as likely as "near Cooktown" it is logically possible.

D. bigibbum ssp. *laratensis* on the other hand had not been discovered at this time and it was not collected in large numbers until 1891. Watson Gard. and Forest 4:521 (Nov. 1891) stated: "Mr Sander has lately imported a large quantity . . . and has disposed of nearly a thousand plants by auction today . . . ". Prior to that few plants were in cultivation. It is unlikely that any plants were imported into Australia from Larat before 1891.

To sum up: Fitzgerald's description and plate describe a plant of typical habit of the Australian subspecies, the size, sepal and petal shape also are typical of it; the labellum shape fits within the variation of *D. bigibbum* ssp. *bigibbum* var. *superbum* and none of the distinctive features present on some specimens of *D. bigibbum* ssp. *laratensis* are shown excepting labellum striations and their presence is the result of an error in depiction as they are present also on his plate of *D. bigibbum.* Furthermore, Fitzgerald stated it was of Australian origin and it was abundant in the general area he stated at the time. The Tanimbar Islands subspecies, on the other hand, had not been discovered at the time Fitzgerald's descriptions were published and in view of these facts it is illogical to state that the type plant of *D. phalaenopsis* was likely to have been imported.

***D. phalaenopsis* R.D. Fitzg. is therefore the valid name for the Cooktown Orchid at specific level but F.M. Bailey, Rupp, T.E. Hunt, St Cloud, S.T. Blake, Dockrill and other authors all have regarded it as not specifically distinct from *D. bigibbum* Lindl.**

It therefore now is reduced to a synonym of *D. bigibbum* Lindl. ssp. *bigibbum* var. *superbum* Hort. ex Reichb.f. subvar. *superbum* as are the names below which were based on it.

***D. bigibbum* Lindl. var. *phalaenopsis* (R.D. Fitzg.) F.M. Bail. Syn. Qld. Fl. 509 (1883)**

***D. bigibbum* Lindl. forma *phalaenopsis* (R.D. Fitzg.) St. Cloud, Nth. Qld. Nat. 24 (No. 115):18 (1956)**

The below two names are also reduced to synonyms of D. *bigibbum* Lindl. ssp. *bigibbum* var. *superbum* Hort. ex Reichb.f. subvar. *superbum.* They were based on plants reported to have been imported from Australia.

***D. phalaenopsis* R.D. Fitzg. var. *schroederanum* Hort. ex Watson, Gard. and Forest 4:521 (4 Nov. 1891) — non Hort. ex Masters.**

***D. schroederanum* (Hort. ex Watson) Hort. ex Gentil, Pl. Cult. Serres Jard. Bot. Brux. 73 (1907).**

The writer would like to extend his thanks to Mr S. Anderson from near Coffs Harbour for allowing him to study plants and his collection and for providing specimens from known localities. He also would like to thank Mr S. Burton and Mr P. Fetherston for providing specimens of plants and Mr J.J. Betts and Mr W. Mitchell for obtaining copies of out of print papers.

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A Word from R.D. FitzGerald

In mid-November, while reading through the proofs of Steve Clemesha's review of *Dendrobium bigibbum* Lindl., I received a letter from the grandson of R.D. FitzGerald concerning the recently published facsimile edition of FitzGerald's "Australian Orchids," Vol.I. He wrote: "I have in my possession a bound copy of Part I, Volume I . . . It contains a printed note immediately preceding my grandfather's preface . . . Presumably all **Part I** Vol. I copies had such a note originally; but in none of the fully bound Vol.I (complete) copies that I have seen is there such a note. Consequently it is not in the new publication either." The writer enclosed a typed copy of the "Note" for my information and use.

It seems to me that this timely word from the past has considerable relevance to what Steve Clemesha has published in this issue of the *Orchadian*. It is therefore reproduced below. — Editor

NOTE

(Inserted in the original copies of Part I. Vol.1 of "Australian Orchids" by R.D. FitzGerald)

The order of publication is not intended to be that of final arrangement; information therefore respecting fertilization and other points that might appear at first to be omitted, will be found under the species intended to represent groups, or under those more directly experimented upon, as in many cases the processes are similar, and repetition would be unnecessary. Localities, unless where incidentally referred to, or where species have been personally found by the author, will be omitted, as it is intended to give a comparative list of distributions at the close of the work, when it is hoped the present publication may have directed more local attention to the subject, and more information may consequently be collected.

Although it is extremely desirable that species should retain the names first bestowed upon them, in the present state of our knowledge of this Order it is impossible altogether to obtain such a result, considering that the original descriptions are often very meagre -- that the specimens by which such descriptions could alone be checked are not in the Colony — that in their comparison for the "Flora Australiensis" Mr Bentham had not the advantage of examining them in a fresh or growing state, and that consequently a number of names have been suppressed by him, without any further description by which they could be re-established if necessary, or distinguished from really new forms.

One of the objects of the present publication is to give an accessible basis of reference; and should it be found from it that, owing to the above causes, the original naming has occasionally been abandoned, it may here be stated that such renaming is not intentional but unavoidable, and a matter of regret to the author.

Dendrobium johnsoniae F. Muell. and *D. purpureum* Roxb. — Australian Natives ?

By S.C. Clemesha.

Two orchids which have been considered to be Australian natives are *Dendrobium johnsoniae* and *D. purpureum* (the latter mainly as *D. ophioglossum* Reichb.f. which has been treated as a synonym).

D. johnsoniae F. Muell. is a spectacular white flowered species which is widespread in New Guinea and some nearby islands.

The only Australian record is a single specimen in Mueller's collection in the National Herbarium of Melbourne which is labelled "Persich, Endeavour River 1884." Though it has been searched for it has not been found wild in Australia. As such a striking species would not easily be overlooked it seems quite clear that the Endeavour River specimen is incorrectly labelled. *D. johnsoniae* **should not be considered an Australian native on existing evidence.**

Dendrobium purpureum Roxb. is a small species related to *D. smillieae* F. Muell. and small plants of the latter are similar to it especially when they are pressed. It is widely distributed, being found in Fiji, New Hebrides, Solomons, New Guinea, Moluccas and Java.

D. ophioglossum Reichb.f. was described from a single specimen in Kew Herbarium collected at Cape York in 1874 by H.N. Mosely of the "Challenger" Expedition. Rolfe expressed the opinion that it was identical with *D. smillieae.* Kraenzlin disagreed, but stated the specimen was in very bad condition.

C.T. White in the *Australian Orchid Review* 19 (1943) published an article accompanied by a photograph of *D. purpureum* under the heading "Has *D. ophioglossum* been rediscovered ?" The plant depicted was a cultivated one imported from the Solomon Islands.

Dockrill in *Australian Indigenous Orchids* stated that *D. ophioglossum* was found from the Portland Roads-Iron Range area northwards. He described and illustrated a plant of *D. purpureum* from New Guinea — (as *D. ophioglossum).*

Recent expeditions by competent orchidologists to the Iron Range-Portland Roads areas and to areas north of there have failed to find *D. purpureum.*

On existing evidence it seems likely that *D. purpureum* does not occur in Australia and that the type specimen of *D. ophioglossum* is a small specimen of *D. smillieae* or that it was not from Australia. **It is not realistic to regard *D. purpureum* as an Australian native on existing evidence.** (We are grateful to Mr Clemesha for the above notes. Attentive readers will recall that the status of *D. johnsoniae* was questioned in *the Orchadian* Vol.5 No.4, p.39 (June 1976) by Dr P.S. Lavarack. There are some who believe this species could still be found in North Queensland — in the wild, that is. They could be right; but there are many more who believe the opposite because of their knowledge of North Queensland as compared with New Guinea habitats. And for the present, anyhow, the latter view must be adopted by those concerned with the proper classification of Australian species and hybrids for purposes of show judging and the Ira Butler trophy for Australian native hybrids. It is understood that the Orchid Society of N.S.W. sought a botanical opinion on this species some time ago and will no doubt promulgate its judging policy in due course. --- Editor.)

1978 ANOS Judging Course

Following a series of seven lectures commencing on June 11, the first judging course was successfully concluded at the ANOS Spring Show at Mona Vale on Sunday, September 10 when a two-part examination was held. The first part was theoretical and second practical using some of the exhibited plants as subjects. When framing the curriculum the Judging committee was determined to obtain the assistance of the most qualified people in their particular field. The sincere thanks of the committee go to Mr Don Blaxell, Botanist specialising in orchids, Royal Botanic Gardens, Sydney; Mr Bert Cardwell, Registrar of the Orchid Society of N.S.W.; Mr Mark Clements, Canberra Botanic Gardens; Mr Roger Bedford, winner of an Ira Butler Award for hybridising; Mr Phill Spence, well known for his work using Australian and New Guinea natives in hybridising and Mr John Stuart, close friend of the late Ira Butler and known for his work on the Ira Butler Award committee. Without their assistance the course could not have been of such high standard. Mention must also be made of the two ladies, Mrs Jill Upton and Mrs Joan Cousins who gave their time to provide refreshments during the breaks in the sessions. The successful participants were D. Barnham, J. Bruhl, M. Harrison, R. Rivett, N. Stockton, J. Walker and G. Wells. The committee congratulate them on their achievement. As it is probable that future judging courses will be required a complete record of all the sessions has been kept and will be available as and when required.

Lloyd Bradford, Chairman, Judging Committee.

Letters to the Editor

Germination of *Dipodium punctatum* (J.E. Sm.) R.Br.

Dear Sir,

I have just completed a Degree in Botany at the University of New England and as a sideline I have grown several batches of Orchid seeds with the facilities available there. Arising from this sideline I have found that one batch is of particular interest and provides a problem to which I have not been able to find an answer. The seeds in question are from some locally growing *Dipodium punctatum*. I have managed to germinate some seeds. Now from these seeds came rhizome-like growths. Some are the brownish colour of rhizomes of normal plants, but some are green. As a saprophyte, *Dipodium punctatum* is not normally in possession of chlorophyll and I have not been able to find any record of such an occurrence, or even of seeds having been germinated.

Could you help me in this respect? I would like to know if people have grown these seeds and whether or not anyone can tell me about the green seedlings in my batch.

Keep up the good work.

R.M.B. 130E Nundle Rd,
Tamworth, 2340. N.S.W. P. Klepzig.

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Commentary on Mr Klepzig's Letter by Mark Clements

With regard to Mr. Klepzig's enquiry on *Dipodium punctatum*, it is my experience that if grown under aseptic conditions in a standard orchid medium such as Knudson C, this species will on occasions produce green roots. This condition probably arises by the roots being exposed to light; in our case a 16-hour day in the laboratory. Light is quite foreign to this species as it normally grows underground in the wild, coming above ground only to flower. *Dipodium punctatum* was first grown from seed at the Canberra Botanic Gardens in 1972.

This species is saprophytic in habit, totally dependent on the mycorrhizal fungus with which it associates, for its food. The fungus obtains its nutrients from the bark of the roots of Eucalyptus trees. The nutrients are transferred back into the orchid's roots where they either diffuse across the fungus hyphae* wall or are absorbed by the orchid when it digests some of the fungus away. It appears that in the case of saprophytes the only thing the orchid provides for the fungus in return for this service, is a home. However this home may be critical for the fungus to survive during periods of stress, such as the summer.

Without the fungus the possibilities of growing this orchid beyond being in a tube, are slim. Fertilizer does not seem to help. It appears that the fungus acts as a protecting mechanism from other pathogenic fungi and bacteria. All of the plants I have transplanted from aseptic medium to soil have died within 6 months of transferral.

Mark A. Clements.
Canberra Botanic Gardens.

*(Hypha (pl. hyphae) is a filamentous unit of a mycelium — which is the vegetative structure of a fungus and is composed of a series of filamentous hyphae — Editor.)

A tetraploid bulbophyllum

Dear Sir,

In April 1978, I appealed through the *Orchadian* for small pieces of *Bulbophyllum aurantiacum* and *B. crassulifolium* required for a genetics project at Macquarie University. The project investigated possible differences between the two species, using techniques for counting the chromosomes.

The response, unfortunately, was not overwhelming yet not entirely fruitless. A fine clone of a so-called *'B. aurantiacum'* was kindly sent to me when my work was nearly completed. The plant was in fact a very large *B. crassulifolium;* which proves how easily these plants can be confused, the very notion of which initiated the investigation.

It was no surprise to me when the plant proved to be a natural tetraploid. Hence its larger than normal growth. Some weeks later it flowered and was a 'true' *B. crassulifolium* with a lovely vivid orange labellum and an even lemon calyx. This plant was extrordinary in that it exhibited characters midway between the species I was looking at. A somewhat pendulous habit was the most striking of these characters.

Mrs Cardiff who thoughtfully sent me this plant should be quite proud that her help not only assisted scientific knowledge of Australian plants but may well help sort out a troubling character distinction between these two *Bulbophyllum* species. I hope also that this case of assistance will be an example to others who saw my appeal in the *Orchadian* but for some reason did not respond. I wonder what else could have occurred if they had.

33 Woodland St.,
Baulkham Hills, N.S.W. 2153 Rayden Rivett.

(Mrs Cardiff is a member of the Darling Downs Group of ANOS. We appreciate not only her response but also Mr Rivett's letter, which gives us the necessary feed-back on what we publish. Without such information we are in the dark. An article on this project by Mr Rivett will appear in the March issue — Editor).

CHANGED SIZE OF THE *ORCHADIAN*

"In spite of our promise in the September issue (No.1 of Volume 6) that the page size of the *Orchadian* would remain constant for the next three years at least — for the purposes of binding — that issue was mailed to subscribers untrimmed and therefore did not conform to the new size. The predetermined size was to be 18 cm x 24 cm. Readers who eventually wish to have their *Orchadians* bound in book form will find that this can be readily trimmed to correct size by the binder.

However, those readers who wish to maintain their copies at uniform size in a reading case (available standard size being approximately 18 cm x 26 cm) or require their Vol. 6 No.1 to be trimmed to 18 cm x 24 cm may take or send their copies to the Printer at the undermentioned address for trimming and return at no cost to the subscriber. Readers who found certain pages unreadable may also return their copies of issue No.1 for replacement free of charge."

B & C Mailing Service Pty. Ltd.,
Attention, Mr J. Harlock,
Box 4142 G.P.O. (1 Hamilton St.) Sydney, 2001.

"The most beautiful orchid in Papua New Guinea."

Dendrobium sophronites Schltr.

by T.M. Reeve.

This New Guinea species is one of the better known of the highland orchids, mainly due to its widespread distribution as well as its brilliant, long lasting flowers which occur in several colours. The German botanist Rudolf Schlechter named this species so because of the likeness of the flowers to the Brazilian genus *Sophronitis.* This species is placed in Section *Cuthbertsonia* which is closely allied to the much larger Section *Oxyglossum.* In some introductory notes on the genus *Dendrobium,* Schlechter gives the following characteristics of these sections in his book "Die Orchidaceen von Deutsch-Neu-Guinea" pp 445-446.

Section *Oxyglossum.*

A section of orchids from New Guinea and the Moluccas Islands. These plants have short pseudobulbs tapering towards the top, each with two to four leaves. The inflorescence, which arises from near the top of the pseudobulb, is commonly 2-flowered, but sometimes there are more. The ovary is usually sharply angled with three to ten corners or wings. In common with Sections *Calyptrochilus* and *Cuthbertsonia,* the column foot is elongated, often closely pressed to the ovary and adnate with the tip. The labellum is characterised by a sharp pointed tip which is usually conspicuous by its bright colouring.

Section *Cuthbertsonia.*

A section of a few New Guinea orchids. The plants are similar to Section *Oxyglossum* in their short pseudobulbs, and allied to Section *Calyptrochilus* with the concave labellum which is also curved inwards. However, it differs from both these sections with the peculiar papillose covering on the leaves and flowers, especially on the ovaries. These papillae consist of numerous small points or protuberances which are piled on top of each other. The type species of this section if *D. cuthbertsonii* F. Muell.

Further on, Schlechter notes that section *Cuthbertsonia* flowers usually have a blunt labellum whereas section *Oxyglossum* flowers exhibit a sharp pointed lip.

There are seven species listed in section *Cuthbertsonia* by Schlechter and J.J. Smith, and these are as follows:

D. cuthbertsonii	F. Muell.	(1885)
D. agathodaemonis	J.J. Sm.	(1910)
D. asperifolium	J.J. Sm.	(1911)
D. sophronites	Schltr.	(1914)
D. trachyphyllum	Schltr.	(1914)
D. atromarginatum	J.J. Sm.	(1929)
D. lichencola	J.J. Sm.	(1929)

From a preliminary study of the descriptions, illustrations, and the accompanying notes, it is obvious that all the above species are closely related. As will be seen below, *D. sophronites* is a very variable species, both in size and shape, especially of the vegetative parts. Further investigation will probably show that most of the above taxons cannot be maintained as separate identities. A close look at the original holotype specimens may be required to settle the issue.

Description.

Epiphytic, sometimes lithophytic or terrestrial; growing in loose or compact clumps depending mainly on the degree of exposure to sunlight. Flowering plants range in size from two to 100 pseudobulbs, the largest clumps being up to 12 cm in diameter.

Roots. Smooth, white (scarlet when wet) with green tips. Approximately 0.8 mm diam.

Pseudobulbs. Very variable in size and shape Commonly ellipsoid or club-shaped, 1.0 – 2.0cm. long x 0.4 – 0.7cm. diam. but may range from spherical 0.5 x 0.5cm. (Fig.A) to elongated cylindrical up to 5.0 x 0.4cm. (Fig.B). The number of internode sections ranges from two to five, and the pseudobulbs may or may not be constricted at the nodes. In general, the longer the pseudobulb the thinner, and this condition appears to arise due to competition from other epiphytes (especially mosses) or herbs if the plant is terrestrial. This occurs in shaded habitats. Elongated pseudobulbs, as shown in Fig.B. are usually thicker towards the apex end. A range of pseudobulb forms may be found on the one plant, but usually the leaf form is constant. New pseudobulbs are covered with bracts which exhibit (but not densely) the same warty papillae as the leaves.

Leaves. Two to five per pseudobulb. Very variable in size and shape (Compare Fig's A, C). Commonly lanceolate but range from ovate to linear-lanceolate; the shorter leaves often being found on plants exposed to sunlight. 0.8 – 4.0 cm. long x 0.2 – 1.5 cm. wide. A typical lanceolate leaf would be 2.5 x 0.8 cm. The leaves are dark green (occasionally reddish) and warty on top, the underside being purplish and only sparsely dotted with the fine, wart-like outgrowths.

Inflorescences terminal, arising with single flowers from both leafless and leafy stems. The floral bract is cup-like, papery and covered with short, wart-like papillae.

Flowers. With the pedicel included, the size of the flowers ranges from 3.0 – 5.0 cm. long x 1.3 – 3.3 cm. wide. The measurement from the mentum to the top of the dorsal sepal ranges from 2.5 – 3.9 cm. The floral parts vary considerably in size as well as shape. The illustrated flower is a typical one. Measurements not indicated on the drawing are as follows: Flower 3.1 cm. long (mentum to tip) x 2.0 cm. wide; pedicel/ovary 2.7 cm. long; column foot 1.55 cm. long; mentum 0.9 cm. long. To show the variation which does occur, the following ranges in measurements are given.

Dorsal sepal: Ovate/elliptical, obtuse 1.2 – 2.1 x 0.8 – 1.5 cm.

Lateral sepals: 2.3 – 3.4 x 1.0 – 1.8 cm.

Petals: Obovate, obtuse 1.3 – 2.0 x 0.8 – 1.6cm.

Labellum: Strongly concave as well as being somewhat incurved, entire (unlobed), central strip thickened. Measurements (stretched out) 2.2 – 3.0 x 1.0 – 1.5 cm. The labellum is usually orange with maroon markings on the top margin, whilst the sepals and petals are scarlet red.

Column: Short 5 – 7 mm. long x 4 – 5 mm. wide. The column foot is elongated, 1.1 – 1.8 cm. long; fused to the labellum and lateral sepals at the base to form a well-defined mentum, 0.9 – 1.5 cm. long. The column is orange and the foot is white.

Anther: Approximately 3.5 x 2.5 mm., orange with darker markings on the top.

Pollinia: Four, in two closely appressed pairs, 2 mm. long.

Pedicel Ovary: 1.7 – 3.2 cm long, red. The ovary is densely covered with quite long, white, wart-like papillae which gradually thin out towards the base of the pedicel.

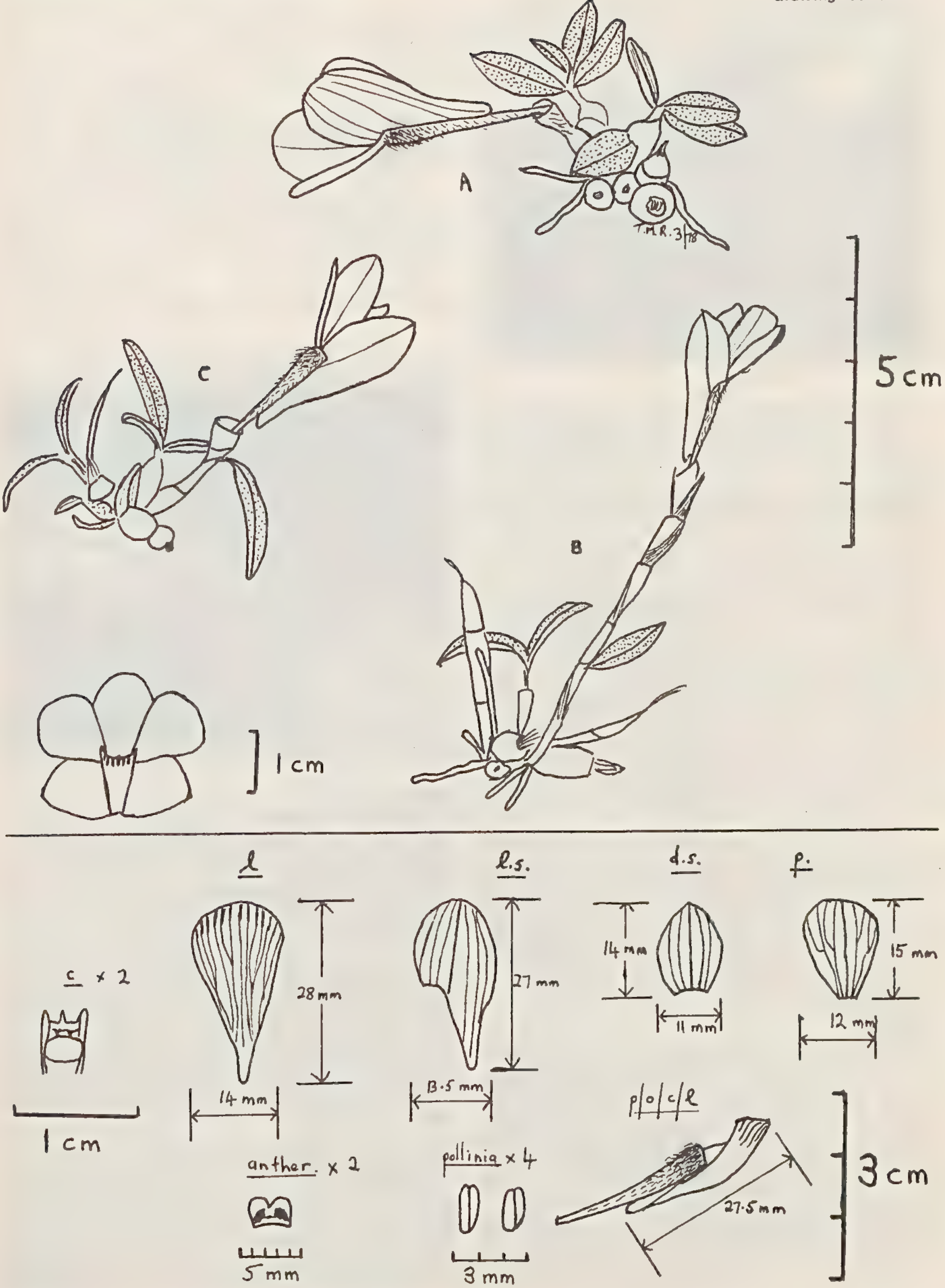
Fruit: The seed pod is characterised by six slightly raised longitudinal ribs, alternating thick and thin in width, which are covered in these special papillae. This species seeds freely in the wild, though pollination by artificial methods is somewhat difficult to achieve.

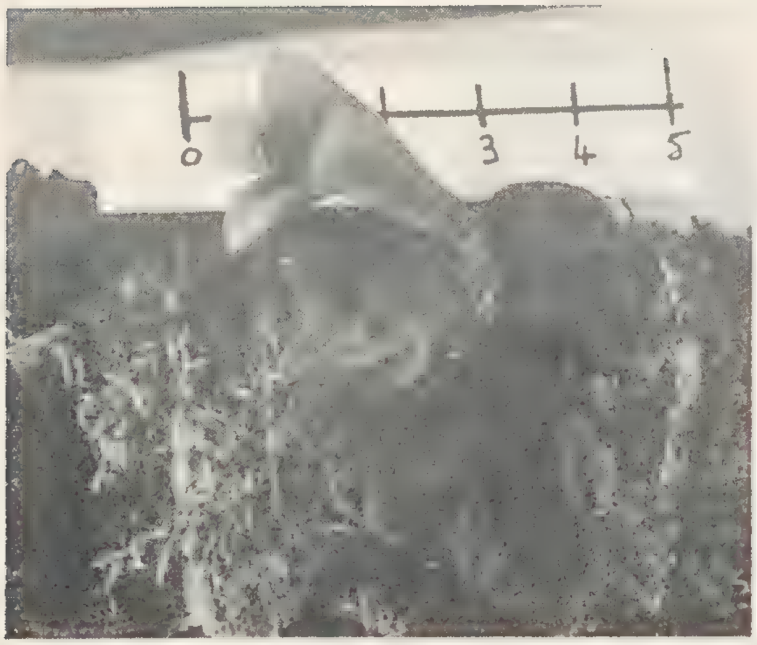
Colour Variations.

As described above, the scarlet-red flower with the orange labellum is the common colour form. However there are several other colour forms for which this species is noted.

Dendrobium sophronites Schltr.

drawing: T.M. Reeve.





Two plants of *D. sophronites* Schltr showing the variation in leaf form (rule marked in centimetres.)

Nearly all of them have the same brown-red or maroon markings at the end of the labellum. The different colours are purple (with white, orange, yellow or purple labellum), yellow, orange and pink. Very pretty bicoloured forms are also seen — red with orange petal and sometimes sepal) tips is the most common and the degree of orange varies. Others found are purple/white, purple/yellow and pink/yellow. A flowering plant of *Dendrobium sophronites,* particularly a bicoloured form, is very striking when encountered in the bush, and in my opinion, ranks as the most beautiful orchid in Papua New Guinea.

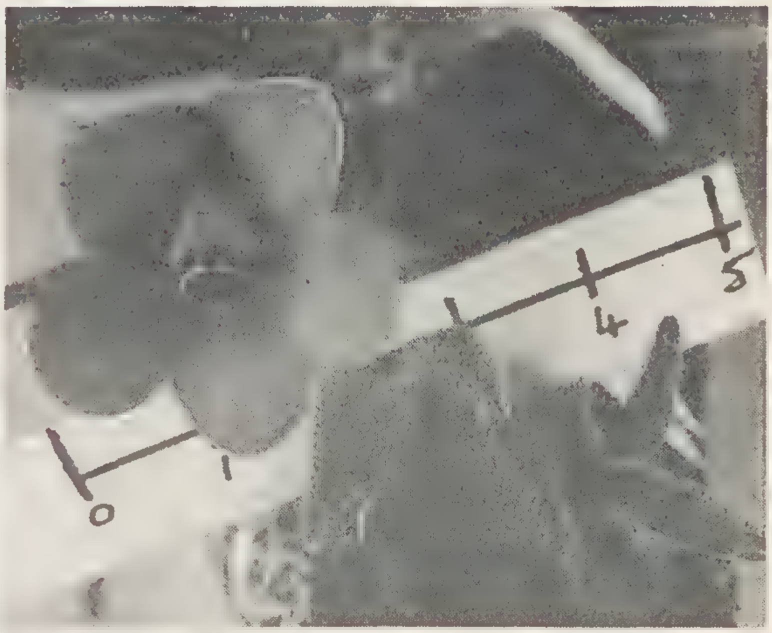
In the wild, patches of orchids of a similar colour are usually found, although the red form has always been predominant in the areas which I have collected from. Some localities have a greater incidence of the colour variations (e.g., Chimbu Province in general.) In the Enga and Southern Highland Provinces the purple form is reasonably common, but the yellows and pinks have so far proved to be uncommon. Some genetic studies, concerning the mode of inheritance of these colour forms would be interesting. Maybe some information on this could be provided by those who have raised seedlings from plants with different coloured flowers.

Flowering.

As the flowers commonly last more than six months, even in nature, there are always some plants in flower. Due to lack of seasonal differences there is no set time for flowering each year. However there are peak times of flowering when large numbers of plants will come into flower together. This appears to be initiated by the onset of a dry spell. A single large plant may have up to 30 flowers showing at once, but two or three is the usual number for the average sized plant in the wild during the flowering time.

Habitat.

Dendrobium sophronites is most commonly found as an epiphyte on a range of host trees, shrubs, treeferns etc., in the mid-montane zone between 2,000 and 3,000 metres above sea level. Occasionally it is found at lower altitudes. It often grows in abundance on the tops of ridges or on forest margins adjacent to grasslands where the plants are subject to some wind or breeze. Such habitats are often enshrouded in cloud, mist or rain for long periods of time, though can be subject to lengthy dry and sunny spells in the dry season. Night temperatures may drop to zero occasionally. In wet, high-altitude grassland areas, *D. sophronites* may occur as a terrestrial, and in some places it readily colonises road cuttings as a terrestrial.



Distribution.

D. sophronites is widely distributed throughout Papua New Guinea, and could by regarded as one of the most common species or the mid-montane zone in the Highland Provinces at least. P.F. Hunt (1970) records this species from the Solomon Islands.

There is no record of *D. sophronites* in West New Guinea (Irian Djaya) in the literature which J.J. Smith published. It is unlikely (a) that such a common and widespread species in Papua New Guinea should not occur in the West New Guinea and (b) that this species should not have been discovered by those thorough patrols which collected plants for the Dutch botanist. After studying J.J. Smith's contributions to "Nova Guinea", it is my conclusion that this species does occur in West New Guinea and that it was described and recorded under the name of *Dendrobium agathodaemonis* J.J. Sm. Some attention shall now be given to the literature on that species.

Dendrobium agathodaemonis J.J. Sm.

This species was named after the place where the first specimen was found — Agathodamonsberg (J.J. Smith, 1911). Anyone wanting to check this species should refer to J.J. Smith's later notes (1913, 1916) in "Nova Guinea", as well as the original description. (See list of References). In comparing the notes with *D. sophronites,* the following points may be observed.

1. The description of the flower by J.J. Smith (1911)

is identical with that of *D. sophronites.*

2. The plant form in the original description was atypical and corresponds to the elongated form of *D. sophronites* as shown in Fig. B. Later on, J.J. Smith (1913) noted the great variation in the size and shape of the pseudobulbs and attributed the short, thickened forms to the effect of high altitude.
3. No mention was made of the papillae on the leaves in the original description. However later, J.J. Smith (1913, 1916) makes specific note of the warty leaves several times. **N.B.** Maybe there are some forms without warty leaves.
4. J.J. Smith (1913) was greatly impressed by the diversity in the colour of the flowers of *D. agathodaemonis.* Red was the predominant colour, but his collectors also recorded purple and yellow-green forms, as well as some bi-coloured flowers.
5. *D. agathodaemonis* is a common species in West New Guinea being recorded by several collectors who sent specimens to J.J. Smith.

I therefore submit that these two names are synonymous, and that this species should be properly referred to as *Dendrobium agathodaemonis* J.J. Sm. It should be remembered however, that both these names may be found to by synonymous with the first named member of this section, *D. cuthbertsonii* F. Muell. Some investigation is currently being made to check this.

Acknowledgments. I thank Mr. G. Hohensin of Laiagam and Mrs C.D.S. Low of Kagamuga for the translation of Schlechter's and J.J. Smith's texts. I also wish to thank Mr Ben Wallace of Armidale, N.S.W. for his help to me when I first became interested in the serious study of Australasian native orchids.

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Hunt P.F. (1970)	Orchids of the Solomon Islands *The Orchid Review* 78.925: 218 – 223
Schlechter R. (1911–14)	Orchidaceen von Deutsch-Neu-Guinea Text pp 445, 446, 523 – 526.
Schlechter R. (1923–28)	*Figuren Atlas.* Tafel 663
Smith J.J. (1911)	"Die Orchideen von Niederlandisch Nieuw Guinea. *Nova Guinea* 8: 576 – 577, Table 96 B.
Smith J.J. (1913)	*Nova Guinea* 12 : 72 – 74
Smith J.J. (1916)	*Nova Guinea* 12 : 335
Smith J.J. (1929)	Orchidaceae. *Nova Guinea* 14 : 422 – 424

SUMMER CULTURAL NOTES – 1978

Dear Orchadians,

Now that summer is with us again, after all the bustle of the orchid show circuit and a bout or two of pollen madness, it is a relief to be able to just sit and watch our plants grow and the world go by.

There is no doubt that our native orchids are resilient. Our plants (here in the Manning River area) that survived the flood waters and silt of last March, had the courage (or audacity !) to send up the most wonderful flowering, considering they were all torn from their pots in April to save their lives from silt smothering. I'd say we would have a third of the flowers that we normally have, but I sure take my hat off to my little friends.

It is always grand just to be able to watch one's native plants progressing at this time of the year as Nature goes about her wondrous cycles of fulfilment and rejuvenation; and how at this time our orchids are racing to obey her. A well kept collection is always a pleasure to see at this time, with new canes appearing everywhere and many earlier growths hardening into adulthood, ensuring that our plants will be able to flower their heads off again next year.

Feeding and fungiciding programmes should now be in full swing, with your plants being fed your favourite brew (and hopefully theirs !) at regular intervals. And please remember the old cry: little and often rather than big and erratic ! In my experience most of our natives seem to do much better with a weak balanced fertilizer. In the period since I started to write for the *Orchadian,* I have not come across any fungicides that appear to be greatly better than the old faithfuls that we have been using over the last few years. In fact, if anything, many have swung back to using old timers, as they do a good job if used as directed and do not appear to have the side-effect problems of a lot of the newer ones.

By this time all plants should have had their old flower racemes snipped off, along with any old canes that are defunct, as to leave any useless trash on a plant is an open invitation to fungus growths. Fungus does not need much of an invitation to step in, but is always on the deaf side when asked to step out again; so shut the door before he gets in at all.

Also, all potting should be well finished by now, to give the plants a chance to hook on while growth is still vigorous.

If you have five minutes to spare, check to see that all hanging containers are in shipshape condition. A wire on one of mine corroded through the other day and crashed to the bench below, with rather harsh effects for the downstairs occupants. Result: some unnecessary damage to plants and more repotting,

Now that the weather is really hot, check your orchid house to see that air movement is adequate, as most of our natives like warmth but not many of them fancy living in a frying pan; in fact I think most of them are happiest when the temperature can be kept to the low thirties (c°) during daylight hours.

Anyone who is doing a bit of hybridising should keep a keen eye on any seed-pods, as they can ripen off incredibly quickly if we get a hot spell at this time of year. Before you know it the pod has opened and the precious seed has blown away. Nothing makes one madder than to see a prize crossing come to nothing. Also, if there are many dendrobium beetles about, guard those pods, as beetles think they are first rate chewing.

It would be great if one could have an orchid house completely enclosed with shadecloth as this would keep the beetles out, but in my part of the world the natives would suffocate if I had the walls closed in with shadecloth. Over the years I have found that I get best results with just birdwire around the walls for the first two or three feet in summer. This lets the air tear through in the summer to help keep the place from getting too hot. And when the cool season comes we just put cheap plastic over these areas to keep the biting cold of winter out. For the small amount of work involved the above will generally give a much improved flowering.

As I have said before, what will suit one grower may not suit the next, but if by discussing these things we can advance our knowledge and improve our growing techniques then it is ink well spent.

Good growing 'till next time.

Ted Gregory.

Native Orchids of New Zealand

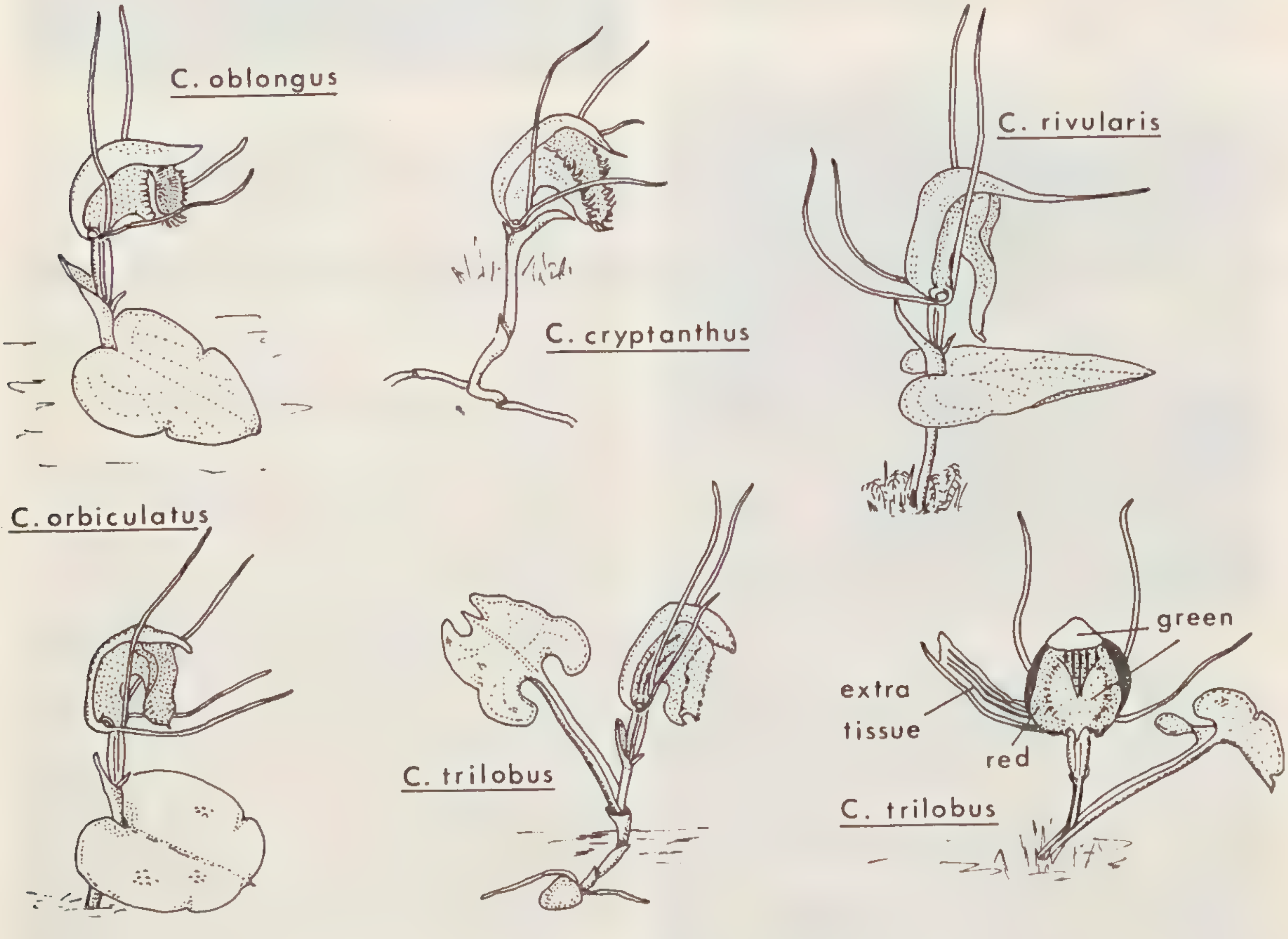
2 – *Corybas macranthus* Reichb. f.

– by Dorothy Cooper

Corybas macranthus can I suppose no longer be called one of New Zealand's endemic species, as it has recently been discovered on Macquarie Island, midway between Australia and Antarctica, but actually part of the state of Tasmania (see "The Orchid Review", No.1019, May 1978). So it can now be said that it is found in Australia if not on the mainland.

Seven other species of *Corybas* are found in New Zealand. Two of them occur in Australia – *C. aconitiflorus* which in New Zealand flowers from April to August, and *C. unguiculatus* flowering from July to October – and we have five other endemic species: *C. oblongus; C. cryptanthus,* a weird 'underground' form that has no leaves or chlorophyll and only its transparent flower, marked with a little red, emerges above the humus; *C. rivularis,* which often grows on rocks in the middle of creeks; *C. orbiculatus,* and *C. trilobus* – the commonest New Zealand species, forming dense carpets mainly by vegetative division, as although there seem to be plenty of flowers, few capsules develop.

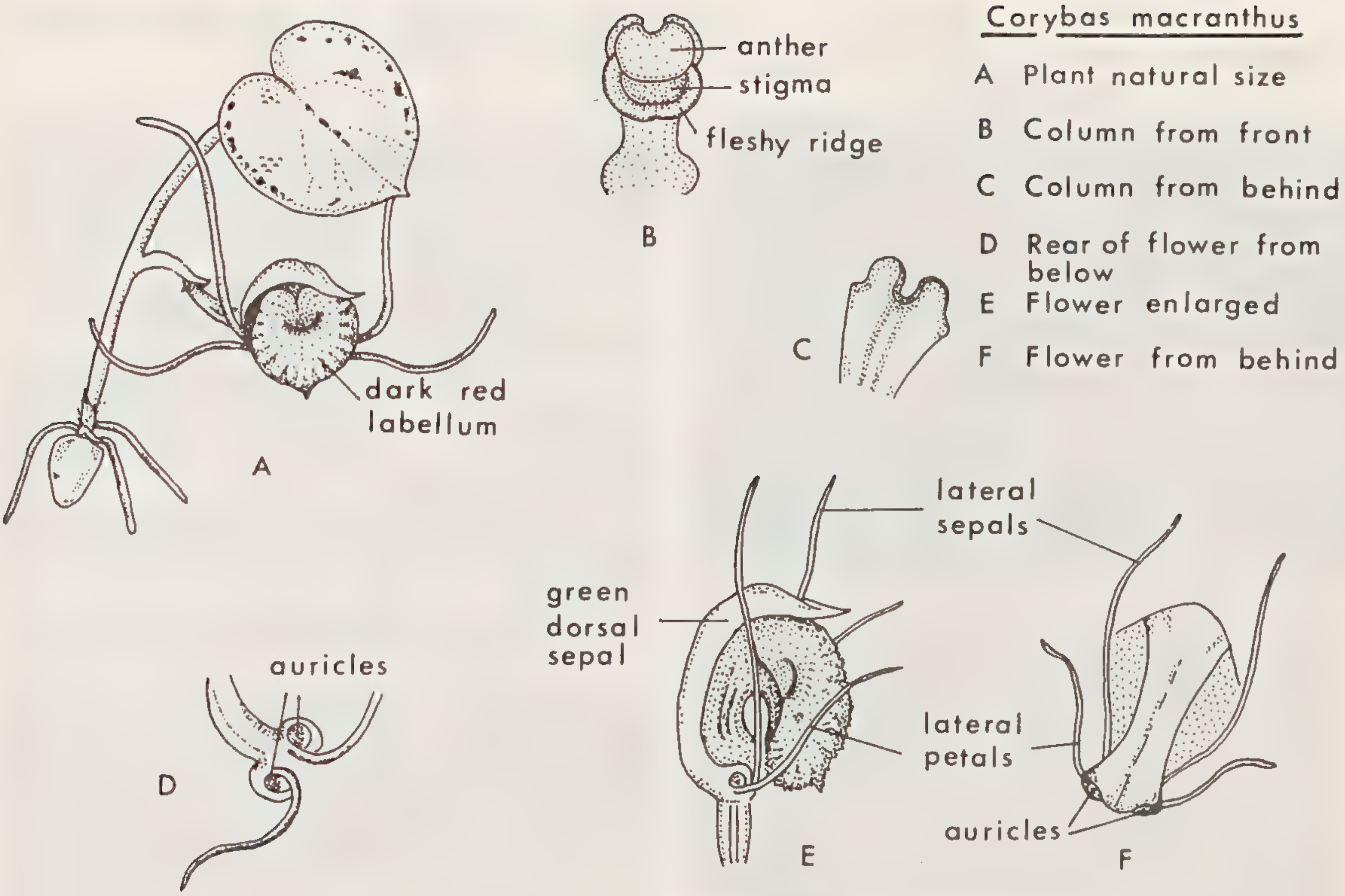
Corybas species endemic to New Zealand



C. macranthus like most of the other *Corybas* has deep red flowers that are proportionately large for the size of the plant. Like *C. trilobus* it forms dense carpets but unlike *trilobus* which grows in dry conditions on steep hillsides beneath our beech trees *(Nothofagus)* or in damp flat areas, *macranthus* seems to prefer wetter conditions. It grows on the forest floor or, as we found it in the northwest of the South Island, on the sides of small creeks in thick wet moss, often completely shaded over with scrub and ferns and like *C. rivularis* is presumably frequently under water when the creeks rise after rain. Vegetative reproduction is important as only a small proportion of the plants flower, and of these only a small proportion develop ripe capsules. Each plant without flowers produces several tubers on long lateral roots, thus the plants spread rapidly, sometimes with no flowers at all, forming large colonies.

C. macranthus differs from most other species in the genus in that the flower is often *below* the leaf, and is consequently hard to find beneath the mass of leaves. Only *C. macranthus* and *C. trilobus* of the New Zealand species have flower and leaf stalks; in other species the flower arises at the base of the leaf and has no stalk or only a very slight elongation below the ovary (see illustrations). All New Zealand endemic species have two bracts beneath the flower, one larger than the other.

The dorsal sepal forms a hood, narrows towards its tip and projects forward over the labellum which has minute "teeth" around its margin. The labellum is relatively large, 1.5cm across, the inner surface is pimpled



Corybas macranthus

A Plant natural size

B Column from front

C Column from behind

D Rear of flower from below

E Flower enlarged

F Flower from behind

Drawings: Dorothy Cooper.

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and rough, and the basal edges overlap to form a tube with the column situated at the base of it. The abruptly deflexed front of the labellum in *C. macranthus* is widely expanded and is a deep rich red-purple. It makes quite a spectacular show with its glossy bright green, broad, almost circular leaf which is firm and fleshy and often marked with red, the surface is papillosed (pimpled) and the underside is silvery. It has a short apical point.

The plant is from 4 — 10 cm tall, the leaves are often quite large in comparison with other New Zealand species — about 3 — 4 cm in diameter, but are usually smaller. They are held more or less horizontally on long stalks, a few centimetres above the surrounding moss.

The lateral sepals and petals, as in all the New Zealand endemic species, are long and filiform, the petals sometimes slightly shorter. As we have also found in *C. trilobus,* one or more of the petals or sepals occasionally have irregular fleshy lobes on them (see diagram). They are sometimes called spider orchids in New Zealand as they look like spiders on the ground with their sepals and petals up in the air. In Australia they are called helmet orchids and their sepals and petals are minute and often hard to find. This illustrates the danger of referring to orchids by their 'common' names.

All New Zealand endemic species have auricles at the base of the labellum. These are small protrusions, one each side, that develop from a slit in the bud into a round lump with a central circular aperture in the mature flower.

The erect column is short and stout with a prominent callus at the base and with expanded lateral lobes near the top forming column wings which exceed the anther. The terminal anther has finely granular pollen in the form of plates forming four pollinia in two pairs. The disc shaped stigmatic cavity is quite deep and has a fleshy ridge around it.

G.M. Thomson in a paper of 1878 "On the fertilisation of some New Zealand Orchids" reports on pollination of the species in some detail. He noted that the rostellum on the posterior margin of the stigmatic cavity is formed of large cells which when touched with a bristle rupture and a small viscid drop exudes. In withdrawing the bristle, the pollinia are brought with it. There appears to be no nectar but the surface of the labellum when punctured also exudes a sweet purplish juice. Charles Darwin in his "Fertilisation of Orchids" notes that in many orchid species, insects actually penetrate into the tissues of the flower in order to obtain its juices. Thomson observed that an insect entering into the tube would presumably take the pollinia on its head when backing out. He found small Diptera often glued to the stigma and when withdrawn from their trap they had the pollinia firmly attached to the front of the head. Spiders seemed to be associated with the flowers because of the trapped flies. He examined 143 flowers; in 47 pollinia were still in the anther cells, in 90 they had been removed, while in 6, dead or living insects were found glued to the stigma. Only a small proportion of flowers ultimately produced capsules.

The fruiting stem of the species elongates markedly as it develops, to 15 — 20 cm, thus aiding in dispersal of seed. It flowers in New Zealand from October to January and is found from sea level to 1500m (5000ft). It is reportedly less common in the north of the North Island, but is found in the North, South and Stewart Islands, the Chatham Islands, Auckland Islands and Campbell Island, so appears to favour the more southerly latitudes.

A Further Note on *Eulophia pulchra* (Thouars.) Lindl. in Australia

by Dr P.S. Lavarack

In *Austrobaileya,* Vol. 1 (also in the Orchadian, March 1978) I recorded *Eulophia pulchra* (Thouars.) Lindl. as a new record for Australia. In so doing I made mention of the malformed flowers of the specimens to hand and remarked "Whether all Australian plants have these abnormalities remains to be proven". The "abnormalities" mentioned are a reduction of the usually three-lobed labellum to a third petal and a malformation of the apex of the column resulting in the breakdown of the pollinia.

Only two inflorescences, both from the Macrossan Range, were available for examination at the time. Subsequently further field trips and the successful production of inflorescences in cultivation have enabled the author to study several more flowers from a relatively widely separated area.

In 1976 on the Australian Orchid Foundation-sponsered field trip to the Iron Range area, large numbers of plants of this species were observed on the Tozer Range about 100 km north of the original locality on the Macrossan Range. However these plants all carried seed pods and no flowers were seen. As almost all ovaries had developed into seed pods, it was suspected that the flowers had self-pollinated and hence that this population probably also possessed the abnormal flowers described above. This was confirmed in June this year when several plants were investigated in the field at Tozer's Gap. All showed the third petal and modified column although the flowers were past maturity and exact details of the pollinia were obscure.

In August this year a plant collected from Tozer's Gap in 1976 flowered in cultivation and it was possible to study mature flowers and buds. The unopened buds, when dissected, revealed two apparently undivided pollinia, which is consistant with the genus *Eulophia.* The pollinia,even in the unopened bud, were very soft and poorly held together. By examining a series of flowers from small bud to mature, open flower it was obvious that the pollinia lose all separate identity shortly before the bud opens and form a large amorphous mass which sits on the stigma ensuring self-pollination in all cases. The flower, as is common with most "selfing" orchids, never opens very widely nor does it last long.

Thus, while it cannot be stated categorically, it does appear likely that all Australian plants are of this "abnormal" form. This form is not, to my knowledge, found in large numbers elsewhere in the range of this species and its presence in Australia could be related to the possible absence of a suitable pollinator.

In the past abnormal forms such as this have occasionally been described as new species. This is understandable when it is realised that so many important taxonomic characters are concerned with the labellum. However the similarities between typical *E. pulchra* and the Cape York plants are so great that I have no hesitation in agreeing with Peter Taylor's view that they are the same species.

Dr P.S. Lavarack,
National Parks & Wildlife Service,
P.O. Box 190, North Quay, Qld. 4000.

A.O.F. Seed Bank List

Correction: The list published in the September issues of *the Orchadian* (p.20) and the *Australian Orchid Review* (p. 176) omitted the genus name *Pterostylis* immediately below the genus name *Phaius.*

Rupp's "Orchids of New South Wales" – Date of publication

The publication date of this major work on N.S.W. Orchids has been accepted as December 1943 (the date printed on the Title page) since the book appeared. However, whilst I was perusing copies of correspondence from Rupp to various people throughout Australia, it became apparent that the year of publication was 1944 and not 1943 as formerly believed.

Extracts from letters from Rupp to T.E. Hunt are quoted to confirm the correct publication date.

(i) 11th December 1943

" . . . . . we still hope to have it out before Christmas. Alas! I fear now that this will not be accomplished. . . . . . I doubt if it will be out now before the middle of January."

(ii) 13th January 1944

"No book yet . . . . . but it can't be long now. They thought some copies would be available by the end of this week; but . . . . . h'm."

(iii) 27th February 1944

"I am glad you found the book of such value; I am receiving many letters to the same effect, ..."

Obviously the book had been received by Rupp (author's copy) and a gratis copy (obvious from other letters) sent to Hunt between January 13th and February 27th 1944, probably towards the end of January. Three leather-bound copies were produced by the printer for Rupp, Dr J.W. Vickery and Mr R.H. Anderson some time before the bulk of the printing was available (J.W. Vickery, pers. comm.). I conclude therefore that the date of publication of "Orchids of New South Wales" by H.M.R. Rupp was most likely late January 1944.

The slightly later date of publication has no major significance in regard to dates of publication of new names. The only ones are the species of *Diuris* described by P.R. Messmer. All of these are now considered to be representative of a hybrid swarm or swarms between *D. maculata* and other species.

D.F. Blaxell, 15th August, 1978

Rupp's Correspondence

Mr Blaxell informs me that our appeal in the September issue for information about letters written by H.M.R. Rupp has brought promising responses from a number of readers. Please do not hesitate to contact Mr Blaxell, however slight you may think your information is – Editor.

A limited number of copies of Rupp's *Orchids of N.S.W.* is available from the Secretary ANOS at $4 per copy including postage within Australia.

Australian Native Orchids For Taronga Park Zoo, Sydney

ANOS Council has accepted an invitation from the Director of the Zoo to sponsor, through its Sydney Group, a plan to establish an orchid garden adjacent to the Koala enclosure (see the message from the new President on the editorial page of this issue.) The project will be on-going for years to come. Would readers who know of suitable plants available in quantity please contact the Secretary ANOS. As the project advances we shall keep readers informed and probably specify particular species needed.

ANOS Groups and the Spring Shows — 1978

by M. Corrigan.

SYDNEY

The 4th ANOS Annual Spring Show held at Mona Vale Community was an unqualified success. The two-day show saw record crowds in excess of last year! More than 880 people saw the show. There is mounting interest in our native orchids. Many who thronged the plant sales tables knew the names of the orchids they wanted, even if they did not know what it looked like.

Well prepared and strategically addressed publicity releases and wide distribution of the Show Schedule had obviously done the job well.

Norm Hilliger, Show Marshall and Bob Lowe, Show Secretary, were backed by an enthusiastic, hard working team who again surpassed their previous efforts. The Judges were confronted with the largest display of plants yet seen. There were 152 plants benched in eleven classes, and two large displays by Walter Upton and Chris Arnott. Whilst there were more plants displayed, the individual flower quality was below last year. This was particularly evident in those plants which were benched last year, in comparison with this year's flowering. This was probably due to the very long, cold, wet winter experienced in Sydney.

Champion Native Species Orchid of the Show was *Dendrobium aemulum,* benched by Norm Johnson. Champion Native Hybrid was *Dendrobium* Rosemary Jupp presented by Norman Hilliger. The Show included a most informative display on hybridising programmes by Phil Collin which was presented with a special prize by the Judges. Congratulations to all concerned.

WOLLONGONG GROUP

Lloyd Bradford and Murray Corrigan, accompanied by John Hazelwood had the pleasure of attending this active group's 2nd Spring Show, held in a large suburban shopping mall. Whilst the site has the disadvantage of providing free viewing by the public it certainly gains tremendous publicity and plant sales for the Group.

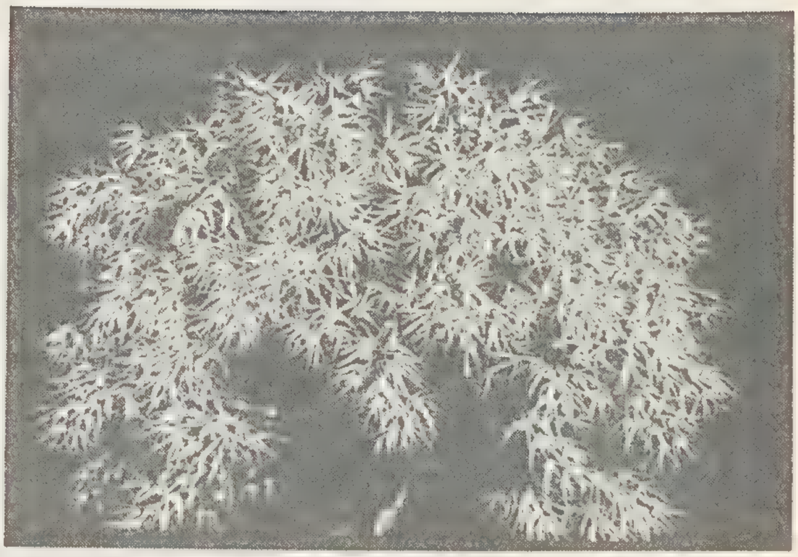
This year's Show was larger, better mounted and more heavily supported than last year, which made the Judges' task all the more enjoyable. Some two hours were spent in determining the winners in the many classes.

Flower quality was excellent with many outstanding clones, particularly in the species. The south coast form of *Sarcochilus falcatus* was very much in evidence with huge glistening white flowers and we were told of one plant, not then in flower, which produces individual flowers larger than a 50c piece. One of the most pleasing aspects of the show was the number of native species which had been lovingly transplanted onto new hosts and which were obviously relishing their new environment.

Wollongong Group's enthusiastic growers will no doubt produce an even better show to delight the eye next Spring.

VICTORIAN GROUP

This active Group, in celebrating their 10th anniversary decided to hold their first ever Spring Show and this Show must be the success story of the year. Careful planning by President John Fanning and his hard working Committee resulted in a show which would gladden the heart of any native orchid lover. Certainly the TV interview between Mr Kevin Heinz and the Group's David Cannon exceeded expectations with considerable comment and resultant publicity. These factors, combined with typical magnificent Melbourne Spring weather, drew an attendance of over 2,000 people to the show in two days. Door takings exceeded $1,000 and native orchid book sales grossed over $700. All profits from the Show were to be donated to the Kim Heinz Cancer Research Fund.



Photography: P. Collin. B & W reproduction: G. Wells

Dendrobium aemulum, the Silver Medal winner for Norman Johnson exhibits the capability of this species for developing specimen plants into huge "snow-balls" of white blooms. Where are the leaves ?

Bronze Medallions were presented to Rick Datodi for his *superb* pot of *Caladenia patersonii* in full flower and to D. and E. Dawes for their *Caladenia latifoliia, Sarcochilus olivaceus, S. falcatus* and *Dendrobium pugioniforme.* J. and E. Vaughan justly deserved their medallions for *superb* plants of *Pterostylis baptistii, Chiloglottis gunnii* and *Dendrobium speciosum.* The massive display of terrestrial orchids was truly outstanding and I was impressed with the outstanding cultural techniques of their growers.

Some impression may be gained from the fact that at the Friday night monthly meeting which preceded the show, there were 76 pots of terrestrial orchids benched. Most of them outstandingly beautiful, often rare, and all displaying themselves *superbly.* In over thirty years association with native orchids I have never been so moved, as by these terrestrial beauties! The success of the Show was far beyond the Group's expectations and may have slightly overwhelmed the organisers. However, I most sincerely hope that they decide to take the plunge and make this Show an annual event, allowing others to share the pleasure of their *superbly* grown terrestrials. I look forward to next years show with keen anticipation.

A Note from Helen Richards — Victorian Group Editor on the Tenth Anniversary Show

The success of our first public show exceeded all expectations. I say first — it couldn't now be our last. The Victorian members rose to the occasion and filled the Herbarium to almost overflowing with flowering plants, far too numerous to record. The first impression, commented on by so many visitors, was the magnificent perfume of the display, and it wasn't just the *Dendrobium falcorostrum.* All the flowers, in the warmth of the weekend, filled the air with their intoxicating fragrance.

All those who participated experienced the feeling of satisfaction of working hard and seeing excellent results for their efforts. Neil Bathie and the other members of the Show Sub-committee could feel justly proud of their success. Over two thousand adults went through the door, and the number of new members who joined the Society after the Show speaks for itself.

Proceeds — about $1,300 — went to the Kevin Heinze Cancer Research Fund.

Book Review

FLORA OF SOUTH AUSTRALIA Part.1. (Third Edition) by J.M. Black, Revised and Edited by John P. Jessop. *Orchidaceae* prepared by J.Z. Weber and R. Bates. Published by The Government Printer, South Australia, 6 July, 1978. (466 pp. Price $16.90). Our copy from the publisher.

This is the first part of a third edition of J.M. Black's *Flora of South Australia.* The second edition was published in 1943 and a supplementary volume in 1965. Part I deals with Pteridophytes, Gymnosperms and Monocotyledons, while the Dicotyledons will be covered in later parts. The book is printed on firm, glossy paper and attractively bound in soft covers of linen finished paper. Included in the text are notes on how to use the dichotomous keys in plant identification and notes describing how plant specimens should be collected and prepared for herbarium use. There is also a glossary of botanical terms used in the text. Thus people with no botanical background, but a basic knowledge of plants can easily learn how to use the book to identify South Australian native plants.

A key to all of the plant families represented in South Australia, including Dicotyledons is placed near the beginning of the book, while the key to genera, species and varieties is interspread with generic and specific descriptions. This edition differs notably from previous editions by the inclusion of many line drawings: In the section on the Orchidaceae, a drawing of every species is provided so that species determinations derived using the key may be readily checked. Another new feature is a section of sixteen beautiful colour plates (from crayon drawings by C.E. Woolcock), including drawings of seventeen orchid species. These exquisitely detailed and coloured drawings enhance the general quality of the book.

The section on the Orchidaceae includes morphological descriptions, distributions and flowering periods of species and varieties. No habitat descriptions are provided, which is a puzzling omission as this information may be very useful in locating populations of the species in the bush.

This treatment represents the current state of the art as far as South Australian orchid taxonomy is concerned. Seven new combinations are included but no reasons are given for these being self-evident. This is the one annoying aspect of the book, and it is strange that these changes were not formalized in a botanical journal before the *Flora* was published. One example of the nomenclature changes is the reduction of *Pterostylis scabra* var. *robusta* to a variety of *P. alata.* Surely such a change would warrent at least some explanation, but none is given. Another curious treatment is the reduction of *Caladenia alba* to a variety of *C. carnea* where it has the same status as less distinct (or even indistinct !) taxa such as var. *gigantea.*

This book can be recommended despite its deficiencies to anyone interested in identifying South Australian native plants. It is by no means the last word on orchid taxonomy, but it is useful in providing descriptions and keys to the taxa currently recognised by the South Australian herbarium.

— Peter Weston

NEW AUSTRALIAN NATIVE ORCHID HYBRIDS

(Registered by the R.H.S. — March and June, 1978)

Hybrid Name	Parentage	Registered by
DENDROBIUM		
King Falcon	*falcorostrum* x Kingrose	D.M. Cannon
Blushing Star	* Suffusum x *tetragonum*	"

The ANOS Victorian Group Bulletin of June 1978 records that D. King Falcon is the first hybrid registered by David Cannon and the first by a Victorian grower.

Pollination was effected in October 1973 and the seed sown in December 1973. Plants were deflasked in 1974 and the first plant flowered in 1976. The *Dendrobium falcorostrum* pod-parent had a 2" (5 cm) flower. The D. Kingrose parent (D. Bardo Rose x D. *kingianum)* measured 1¾" (4.5 cm) across with deep marks on the outside of the flower, fading to a lighter shade in the centre. Four or five flowers were borne on an upright raceme. D. King Falcon produced a flower with full petals and sepals — larger and fuller than D. Bardo Rose. We understand Mr Cannon will propagate it by "mericloning."

The August Bulletin (Victoria) reports on the second hybrid from Mr Cannon as follows:

Pollination October 1970; first flower November 1977 (and again February 1978) — good size, similar to D. Ellen; margins of the tepals pink to maroon fading towards the centre which is speckled with pink; large labellum.

* **This symbol "marks the first occurrence as a parent in hybrid registration of the natural hybrid *(Dendrobium* X *suffusum* (Suffusum hort) = *(gracilicaule* x *kingianum)* 1964"**

Incidentally, as the registration authority has recorded this cross with "Suffusum" spelled with a capital 's' and not in italics it appears that Mr Cannon made it with an artificial, rather than the natural, hybrid. The Victorian Group Bulletin tells us the *C. tetragonum* parent was var. *giganteum* but of course varietal names are never recorded in registration.

What's in a name ?

One of our more discerning members has pointed out that Noel Jupp has made very apt use of the term "Star" in all his registered hybrids which have *D. tetragonum* as a parent — namely Star of Gold, Allyn Star and Star Imp. There are five other registered crosses with *D. tetragonum* made by other hybridists — none of them using "Star" in the hybrid name. It seems a pity therefore that with the advent of Cannon's "Blushing Star" the word "Star" can no longer be taken as a convenient indicator of Jupp's range of hybrids made with *D. tetragonum.* A pity, too, that we are unable to show readers what these things really look like.

Sequel to the "Compactum" error (D. bigibbum again !)

In our June 1978 issue (p. 191) we reproduced an "Important Notice to Dendrobium Growers, Registrants and Originators" from the R.H.S. (*Orchid Review,* January 1978, p. viii). We concluded that two registered hybrids, *Dendrobium* Merritt Island (1969) and D. Mini Pearl (1974) should now be recognised as Australian Native Orchid Hybrids because *D. bigibbum* (not *D. compactum)* was in the parentage along with another Australian indigenous species in each case. *(D. dicuphym* in the case of Merritt Island and *D. canaliculatum* in the case of Mini Pearl). The R.H.S. has now published a "General Correction" in the August, 1978 issue of the *Orchid Review* and the following extract concerns our "Checklist" records as it confirms our advice in the June Issue of the *Orchadian:*

"(A) In each of the following Dendrobium hybrids the parent *compactum* should read *bigibbum* wherever it occurs in the lists shown including in the cases of the 61/70 Sander's Addendum and the 71/75 Sander's Addendum, the correction, deletion or insertion, as appropriate, under the second (unaltered) parent name, the incorrect parent name, and the parent name as corrected;-

Den. Merritt Island (O.R. December 1969; 61/70)
Den. Mini Pearl (O.R. August 1974; 71/75)"

There are 18 hybrids in the list. We quote only those obviously affecting us. Then follow a number of consequential corrections to the *Orchid Review* lists and Sander's *Addendums* 1961/70 and 1971/75. It would be a wearisome task to trace all of the effects of the past carelessness of registrants (and perhaps also of the registration authority ?). It seems sufficient at this stage to point out the changed status of the two *Australian* hybrids. However, in view of the new combination of *D. phalaenopsis* with *D. bigibbum* by S.C. Clemesha in this present issue of the *Orchadian* there could be more and it may well be necessary to look further at all past registrations which included *D. phalaenopsis* in the lineage of one or more of the parents.

To stimulate our more painstaking readers, let us quote from an article by David A. Bishop in the *American Orchid Society Bulletin* of August 1974 (p. 709) which traces the ancestry of D. Hickam Deb ("The most awarded *phalaenopsis* — type hybrid"). Bishop says "Hickam Deb and its forebears, simply stated, are extremely happy combinations of *phalaenopsis* and *bigibbum."* After reading the Clemesha findings you may well wonder how many of those past registration references to *D. phalaenopsis* were really references to the Australian *D. bigibbum* and not to the sub-species *laratensis.* At least we know that when Mr Willersdorf referred to *D. phalaenopsis* in his registration of D. Suzanne it was to a plant "**collected in the Cooktown area**" (personal letter to the Editor on 9/11/78). As D. Hickam Deb carries about 6% of *D. taurinum* of course it is not purely Australian. But what of D. Lady Constance (75% *"phalaenopsis"* and 25% *bigibbum)* D. Orchidwood (50:50) and D. Louis Bleriot (50%, 25% + 25% *D. discolor)*?

— Editor.

Pollination of Australian Orchids

Professor Warren Stoutamire, a lecturer at the University of Akron, Ohio, U.S.A. has studied the pollination of some Australian orchid genera over a period of several years. He has visited here with financial support from the National Science Foundation (U.S.A.) primarily or, on his last visit, partly from the Australian Orchid Foundation. His knowledge and expertise in the field of orchid pollination phenomena, both in Australia and the U.S.A. is extensive, and together with David L. Jones (also a member of the Research Committee of the A.O.F.), he would be one of the foremost authorities on this subject in the world.

We are fortunate that Warren has been able to carry out field work on three occasions in this country, but it is ironic that financial support for such a project has been largely available from the U.S.A. and not from any Australian authority. I am pleased that the Australian Orchid Foundation has been able to supply some of the finance towards this research project. With the financial support of all orchid enthusiasts in Australia, the A.O.F. may in the future, be able to fund extensive projects of this kind by Australians.

D.F. Blaxell, Chairman, Research Committee,
Australian Orchid Foundation.

Report to the Directors, Australian Orchid Foundation, by W.P. Stoutamire, Biology Department, The University of Akron, Akron, Ohio 44325, U.S.A.

Acknowledgement

The $300 awarded by the Australian Orchid Foundation in support of my research in Australian orchid pollination was used to defray travel expenses during December, 1977, in Victoria and the A.C.T. The research was also supported by the American Orchid Society and the National Science Foundation, the latter being a cooperative programme with the Australian Office of Research, myself, and Alexander S. George as collaborators. The Award by the Australian Orchid Foundation is gratefully acknowledged. I also acknowledge the advice and assistance of Alex S. George, who helped in many ways.

Research Report

I observed wasp pollinated orchids in Western Australia September-November and in Victoria during December, stopping briefly in Canberra to deliver insect specimens for identification and to confer with Dr Tom Bellas of CSIRO and Mr Rich Rickard of Australian National University. In addition to field observations of wasps and orchids I attempted to isolate and characterize the attractants, but the latter approach was not productive in the time available.

The source of pheromone production in *Caladenia huegelii, C. dilatata* and *C. lobata* is the sepal club apparatus, although the labellum also produces some attractant. Attractant is present in the water in which *Drakaea glyptodon* flowering stems have been kept, indicating either that the stem is producing pheromone in addition to the flower or that the water absorbs flower-generated pheromone. Pheromones of *Drakaea glyptodon* and *D. elastica* can be absorbed in water solutions and they are inactivated by strong acids but not by strong bases. They can be removed from an airstream passing over the flowers in a dry ice-alcohol cold trap and the condensate retains its activity.

A major problem encountered in attempts to isolate and characterize the attractants was the unpredictability of wasps in the field. They are sensitive to temperature changes, to clouds passing overhead, and they also have the ability to learn avoidance reactions. Lack of response is not necessarily due to an inactive bait. Only positive results are meaningful in a field test.

Pheromone research must involve captive wasps using electro-antennogram techniques in the laboratory to eliminate the field variables. This technique is being used in other insect pheromone research in Canberra. Our attempts to demonstrate electrical responses in the antennae of *Lissopimpla* wasps using *Cryptostylis subulata* flowers were not successful. Strong electrical activity was not related to flower odours in our brief trial. I see no reason why the technique should not work given time to perfect the technique with orchid wasps. I hope to pursue this subject in the future. I plan to publish the results of this work when my teaching duties allow time.

SEED FLASKING SERVICE

Flasks of seedling Australian Native Orchids offered for sale to members in our June issue have taken longer than was anticipated in reaching the stage of being ready for delivery. The first flasks to go out were those of *Sarcochilus weinthalii* in early November. If your order has not yet been filled please do not think the Secretary has forgotten you. Flasks are not sent out until the seedlings reach a satisfactory stage of development.

DEANES ORCHID NURSERY

We have a large selection of Australian and exotic orchid species as well as many hybrids suitable for both shade- and glasshouse conditions.

Composts, pots, corkboard, etc., also on hand.

List available on request.

Nursery open every weekend — weekdays please phone first.

29 HEMERS ROAD, DURAL, N.S.W., 2158
Phone: (02) 651-1798

President's Annual Report

(Presented to the Annual General Meeting of the Australasian Native Orchid Society – 2 September, 1978)

This is my final annual report to members at the conclusion of a three-year term as President. Looking back at my two other annual reports I find that one or two objectives expressed in them have not been achieved. Nevertheless each year has been better than the last and this is specially true of 1977 – 1978. Our progress, financially is very apparent in the Honorary Treasurer's Statements presented with this report

Membership has continued to increase – from 469 at 31 August 1977 to 569 at 31 July 1978 after removal from our subscription list of 27 unfinancial members.

New Groups. A new ANOS Group has been inaugurated as the Hastings Valley Group in N.S.W. and the two founded during the preceding year are clearly thriving. We now have seven local groups established.

The Orchadian has just completed its 15th year of publication with a new format adopted when I took over editorship from September 1977. This has been well received. I am indebted to the contributors who make this journal what it is and to the Associate Editors for Queensland and South Australia who were appointed during the past year. Rising costs have been offset partially by the sale of advertising space. The sale of back issues of the "Orchadian" continues to be an important source of income. In December 1977 we published "A Checklist of Australian Native Orchid Hybrids" for the benefit of members and as a free supplement to the journal. This, too, was very well received and it is intended to revise and republish it from time to time.

The Judging Course which was promised in my last annual report is now a reality. The Committee appointed to examine the feasibility of such a course has proceeded to implement it successfully and ANOS Council has appointed the four members of the Committee as Judges of Australasian native orchids. We are indebted to the lecturers and others who have given their valuable time to this project. We are indebted also to the Ryde School of Horticulture for the classroom accommodation and facilities they have provided. We are confident that this course will be immeasurably valuable to all students participating – whether or not they ultimately become judges.

The Flasking Service continues as a popular service to members and Council has been able to offer a number of flasks of Australian native orchid species seedlings for sale to members.

The Third Spring Show, of September 1977, again improved on the success of the preceding year. This show has now become established as an annual event. The Society is once again indebted to the President of the Warringah Group, Mr N. Hilliger, for his careful organisation as Show Marshall and to Mr R. Lowe (Vice President of ANOS) as Show Secretary.

Attendance of Councillors at Monthly Meetings: Eleven monthly meetings were held from September 1977 to August 1978 inclusive. Attendances were: J. Betts 11, L. Bradford 10, P. Collin 10, M. Corrigan 8, K. Edwards 10, E. Gordon 9, R. Lowe 11, G. Wells 9, P. Weston 6, P. Vaughan 5 (resigned during the year). Members co-opted for one or more meetings included Messrs J. Hill, J. Simmons (S.A.) and W. Upton.

I must now thank all of these people sincerely for all they have done for the Society in the past 12 months whether as Councillors or as co-opted members on special projects. Without them progress would not have been possible. To those who are vacating positions on Council at this meeting I offer my own gratitude and that of the Society. I express the hope that they will continue to work for the Society according to their individual talents as time and opportunity permits.

In Conclusion: Although I regret relinquishing the role of President at a time when this Society is going from strength to strength, I endorse the existing rule that the term of office of the President should be restricted to three years. It exhibits the principle that vitality can be maintained only by regular introduction of new blood at the management level. I commend this principle to the incoming Council in their task of maintaining the present impetus and ensuring that ANOS continues to grow in stature and influence. I wish the new President every success.

J.J. BETTS
President,
2 September, 1978.

Australasian Native Orchid Society
Statement of Funds for Year Ended 30/6/78

Opening balance – Current		986.85		
	Fixed Deposit	1,500.00	2,486.85	
Plus Receipts			5,430.97	
			7,917.82	
Less Payments			3,894.99	
Closing Balance				4,022.83
Comprising amounts				
held in fixed deposit				1,500.00
Available for general business				2,522.83
				4,022.83

Treasurer's Statement of Receipts and Payments

Receipts	1977/78 $	1976/77 $
Membership, subscriptions		
Arrears	89.00	127.79
Current	2,086.00	1,349.91
Advance	501.00	286.88
Bank interest	186.84	164.52
Sale of badges	58.00	94.20
Sale of Orchadians (back issues)	978.65	889.03
Sale of Sarcanthinae	–	10.00
Sale of Check List	81.20	–
Donations	81.96	219.56
Advertising		
Inserts in Orchadian	71.50	40.00
Adverts in Orchadian	425.00	–
Flasking service	58.00	38.00
Sale of ANOS flasks	81.25	65.40
Profit Spring Show	318.57	242.99
Judging course	414.00	–
	5,430.97	3,528.28

Payments	1977/78 $	1976/77 $
Printing Orchadian	2,652.68	2,141.87
Printing miscellaneous	208.57	77.48
Printing "Check List"	276.00	–
Purchase of books	–	69.02
Purchase of badges	14.40	–
Advertising	52.20	35.36
Insurance	27.40	25.40
Maintenance Typewriter	–	50.00
Book binding	–	72.00
G.P.O. Box	30.00	30.00
Affiliation fees	16.00	17.00
Bank charges	6.70	5.50
Flasking of seed	–	112.00
Schlechter translation	148.71	–
Miscellaneous expenses	339.41	304.42
Judging course	122.92	–
	3,894.99	2,940.05

I have examined the books and records of the Australasian Native Orchid Society and report that the above Statement of Receipts and Payments is in accordance with those books and records.

(P. COLLIN)
Honorary Treasurer

(D. SCOTT-YOUNG)
Honorary Auditor

Who's Who

THE AUSTRALIAN NATIVE ORCHID SOCIETY OFFICERS AND GROUP CONTACTS.

ANOS Council

President: J.A. Walker; Vice-Presidents: E. Gordon and L. Bradford; Secretary: K. Edwards; Assistant Secretary: Ms M. Shelley; Treasurer: P. Collin; Editor: J.J. Betts; Assistant Editor: P. Weston.

ANOS Group Officers and Affiliated Societies.

NEW SOUTH WALES:

- *Sydney Group:* President: J. Walker (Tel. 419 2529)
  Meets 8 p.m. 2nd Friday each month, Ryde School of Horticulture, 59 Parkes Street, West Ryde.
- *Warringah Group:* President: N. Hilliger (Tel. 99 2468)
  Meets 8 p.m. 2nd Thursday, Stony Range Flora Reserve, Pittwater Road, Dee Why.
- *Newcastle Group:* President: W. Moloney, 11 Crestwood Place, Warners Bay, 2282.
  Meets 4th Wednesday, John Young Community Hall, Thomas Street, Cardiff.
- *Wollongong and District:* Secretary: Mrs. Y. Parkinson, 23 James Road, Corrimal 2518.
  Meets 2nd Tuesday at the Meeting Room of the Wollongong Town Hall.
- *Hastings Valley Group:* Secretary: Mrs N. Blanch, RMB60, Pappinbarra Road, Beechwood, 2446.
  Meets 7.30 p.m., 4th Friday at Beechwood Methodist Church Hall.
- *Blue Mountains and District Orchid Society (Affiliated):* President: D. Wallace (Tel. 39 2091), Secretary: K. Edwards (Tel. 21 8126). Meets 8 p.m. 4th Friday, Red Cross Hall, Springwood.
- *Cumberland Orchid Circle (Affiliated):* Secretary: Rayden Rivett, 33 Woodlands Street, Baulkham Hills 2153. (Tel. 639 4156). Meets 4th Wednesday.

VICTORIAN GROUP:

- Secretary: Mrs R. Wootton, (Tel. 754 6585). Meets 8 p.m. 1st Friday, the National Herbarium, Royal Botanic Gardens, Melbourne.

QUEENSLAND:

- *Darling Downs Group:* Secretary: Dr N. Grundon (Tel. 35 2570). Meets 7.30 p.m., 3rd Friday at the Auditorium, Technical and Further Education Centre (Extension Services Annexe) 54 Neil Street, Toowoomba.
- *Native Orchid Society of Queensland (Affiliated):* President: Dr P.S. Lavarack, Secretary: Mrs V. Swaffer, c/- G.P.O. Box 1358 Brisbane, Queensland 4001. Meets 8 p.m., 1st Monday at Bread House, 49 Gregory Terrace, Brisbane.

SOUTH AUSTRALIA:

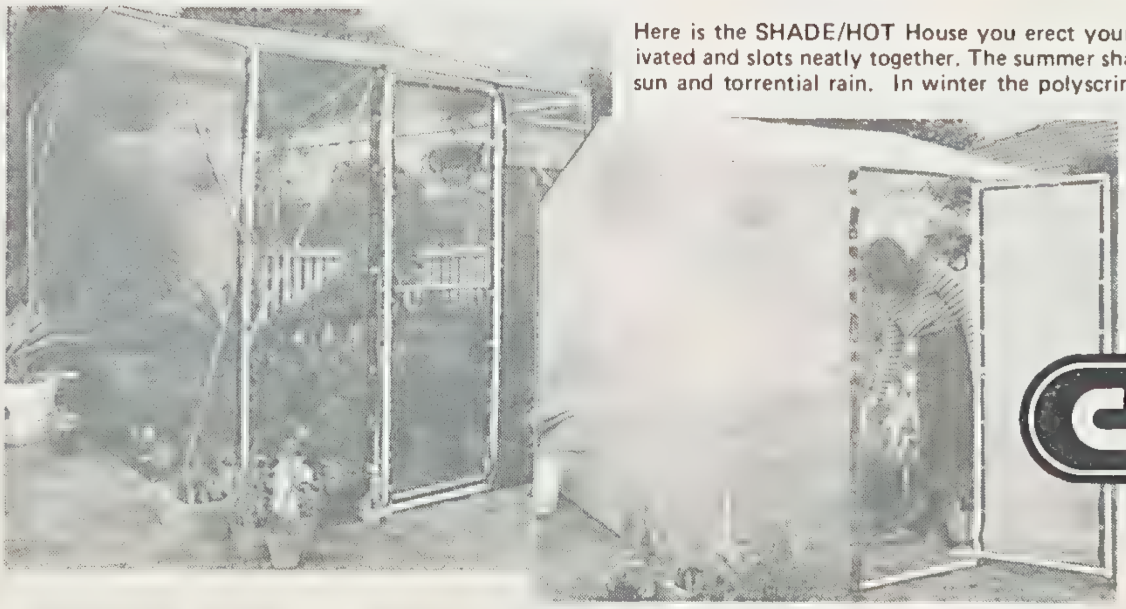
- *Native Orchid Society of South Australia (Affiliated):* Secretary: E.R. Hargreaves, (Tel. 293 2471 or 297 3724) Meets 4th Tuesday, Goodwood Boys' High School, Hardy Street, Goodwood, Adelaide.
- *Northern & Eastern Districts Orchid Society (Affiliated):* Secretary: W.G. Joffre Keen, 22 Campbell Street, Oaklands Park, South Australia 5046.

WESTERN AUSTRALIA:

- *W.A. Native Orchid Study and Conservation Group (Inc.) (Affiliated):* Secretary: Ms L. Penny, Unit 6, 63 Fourth Avenue, Mt. Lawley, W.A. 6050. Meets 1st Friday at the Dept. of Agriculture's Film Room, Jarrah Road, South Perth.

NORTHERN TERRITORY:

- *Darwin Orchid Society of N.T. (Affiliated):* President: Mrs R.L. Bromwich, Secretary: Mrs G.C. Heinemann, P.O. Box 38493, Winnellie, N.T. 5789.



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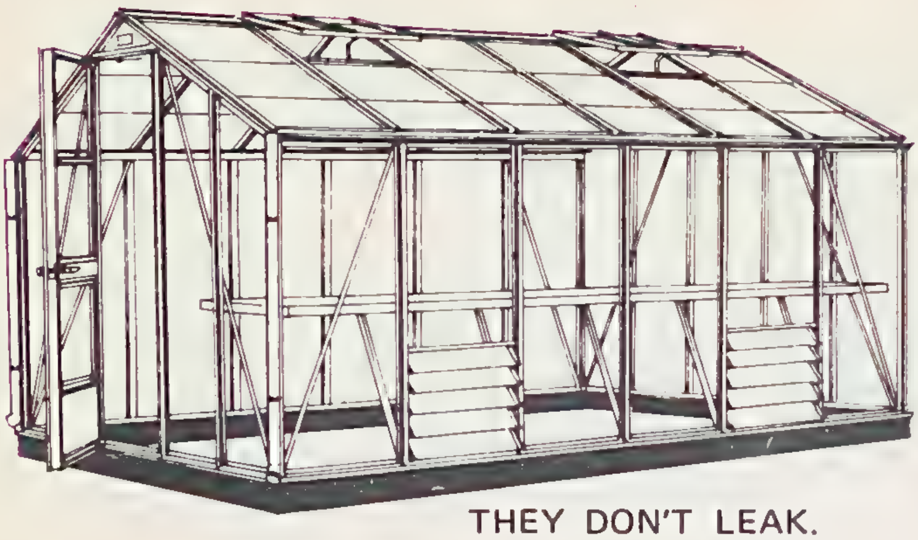

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The Orchadian

Dedicated to the study and care of
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MARCH, 1979

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- Victoria

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- Native O.S. of Queensland
- Native O.S. of Sth. Australia
- W.A. Native Orchid Study & Conservation Group (Inc.)
- Darwin O.S. of N.T.
- Others are listed by States inside back cover.

In general **Group** meetings are concerned with native orchids exclusively.

Affiliates are generally devoted to exotic orchids but have a particularly strong interest in Australasian natives as well.

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- Orchids of South West Victoria
- More on methods of cultivation of terrestrials
- Papua New Guinea — a new dendrobium species to be described

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If sufficient orders are received for Vol. 1 reprinting may be possible. Please let us know without delay.

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THE ORCHADIAN

Founded August, 1963

Editor: J.J. Betts

Honorary Associate Editors: Dr N.J. Grundon (Qld), Mr J. Simmons (S.A.)

Volume 6 March, 1979 No. 3

EDITORIAL

In the last issue I plaintively asked for more writers on "cultural information" for our many keen growers. Was it the passionate prose of Carlyle that I quoted, or was it just the bold typeface? Anyhow, look what I got! Two pieces from Ted Gregory (not unexpected, of course) and the first of a series of articles from Les Nesbitt on "terrestrials". Terrestrial — but out of this world so far as I am concerned.

Personally I have never been a competent or even enthusiastic grower of ground orchids but, having listened to Les, having seen his nursery in Adelaide and having read the first of his articles, I hereby predict that there will soon be many, many more growers in this challenging specialised field, including myself.

Then look at the notes from Jim Simmons on how to deal with Australian dendrobiums. Any complaints about this lot will be cheerfully accepted — along with your own contribution (typed in duplicate etc.). It is nice to know one has only to ask . . .

Dare I make another complaint so soon? Why not? Those Letters to the Editor are not coming in fast enough. **"Out with it then"**, but make it worthwhile — the sort of stuff you give out at your favourite orchid society's monthly meetings while the minutes are being read. What about something constructive on the state of the present judging standards applied to native species and hybrids?

Turning to more pressing matters: we have to consider a proposed new constitution for ANOS. Please don't fail to read the draft sent out with this issue and have a look at the Hon. Secretary's "Notice" at page 61. The old constitution was long overdue for overhaul and, as directed by the last Annual General Meeting, ANOS Council has done its bit. Now it's up to you, as members.

That the *Orchadian* is late in coming to you this quarter is a matter for which I must apologise to readers everywhere. The Post Office strike presents a convenient excuse but I am afraid I cannot use it — as is so often done these days to cover up one's own delays. Our delay is partly owing to staff changes at the printer's and, largely, to my own difficulties.

As soon as the December, 1978, *Orchadian* appeared I had a personal telephone call from Charlie Taylor who was to pass away within two days. Very many readers will know of this loss, for Charlie was perhaps the best known personality in the orchid world of Australia, and most orchid society bulletins in Sydney have published valedictory notices in the past few months. It was my pleasure and privilege to know Charles Taylor only for the past 10 years, so I make no attempt here to review his achievements over a good, long lifetime. He was a horticulturalist for most of that lifetime. With orchids as his greatest interest, he was a pioneer with the post-war development of cymbidium cut flowers for export; but by the time I met him, species orchids of every kind were his keenest interest. This was very clear to me at last year's World Orchid Conference when, together, we braved the sweltering heat and odours of the Bangkok street market driving hard bargains for "species only".

So far as ANOS is concerned, Charlie Taylor was a foundation member in 1963 and continued enthusiastic participation until he died. Which brings me back to my opening sentence. The purpose of his telephone call was, first, to talk about two interesting native orchid "finds" he had made within the past 12 months — one in Queensland and one in Western Australia! Both had been delivered to the Sydney Herbarium for examination. His second purpose was to congratulate us on the quality of the December issue of the *Orchadian*. Charles Taylor will be remembered for a long time.

FEEDBACK AND FOLLOW-UP

- The ANOS Seed Flasking Service has not been an unqualified success. Its administration is not as simple as one might expect. Some improvements will have to be made. In the meantime ANOS Council regrets that there will be no more advertising of flasks available for sale to members — at least until they are actually on hand and ready for despatch or collection. Seed pods will, of course, continue to be accepted from members for flasking.
- Lansdowne Editions, the publishers of the facsimile reprint of R.D. FitzGerald's *Australian Orchids* inform me (13 March, 1979) that "Volume 2 is printing and collating, and binding should commence mid-March. A brochure is currently being produced". The letter goes on to say that "we will hold our price of $350". It seems, therefore, that we can assume the same discounted price for members of ANOS ($300) that they enjoyed for Volume 1. We should have further information for readers in our June issue. Meanwhile, any comments on this collector's item would be welcomed from those who have already received their copy of Volume 1.
- A recent list received from Miss Doris Eddey of 30 Kardinia Road, Glen Iris, Victoria, 3146, who specialises in the sale of rare, out-of-print books, indicates that she is offering W.H. Nicholls's *Orchids of Australia* — the 1951-1952 limited edition published by Georgian House. This is superior in quality of reproduction to the later Complete Edition published by Nelson (also out of print). It comprises Parts I and II, is in loose folio form, and contains full colour plates of terrestrial orchids only. We understand that copies are in new condition. At the price listed ($20) we feel this is a bargain that should be brought to the attention of our readers — especially those who have written to us for information about the availability of Nicholls.
- Bill Murdoch, foundation President of ANOS, is frequently in touch with us from 30 Robey Road, Coal Point, N.S.W. 2283 (near Newcastle). Bill is still as critical and vital as ever and — judging from past letters I have had — may well criticise Dr Lavarack's article in this issue on the subject of conservation and conscience. Meanwhile, I shall pass on to readers his latest suggestion: that Christmas greeting cards bearing colour pictures of native Australian orchids (not hybrids, of course) would be very appropriate if produced for sale in quantity to Groups and affiliated societies throughout Australia. Membership reaction seems desirable. ANOS Council is not in a position to take up the suggestion, at least for the present.

Native Orchids of New Zealand
3 – *Aporostylis bifolia* Rupp *et* Hatch

– by Dorothy Cooper

One of the three genera found in New Zealand but not in Australia is *Aporostylis* – the other two are *Earina,* an epiphytic genus common throughout New Zealand, and *Yoania,* a terrestrial genus limited to the Auckland district.

During the early days of New Zealand botany *Aporostylis* was known under several names, including *Caladenia bifolia* when it was first collected by Hooker in 1853, and *Chiloglottis bifolia* Schlechter 1911. It does have similarities to both these genera but in 1944 Rupp and Hatch decided it did not really fit into either genus and it was given its own – *Aporostylis.* There is only one species, and it is confined to New Zealand and its outlying islands.

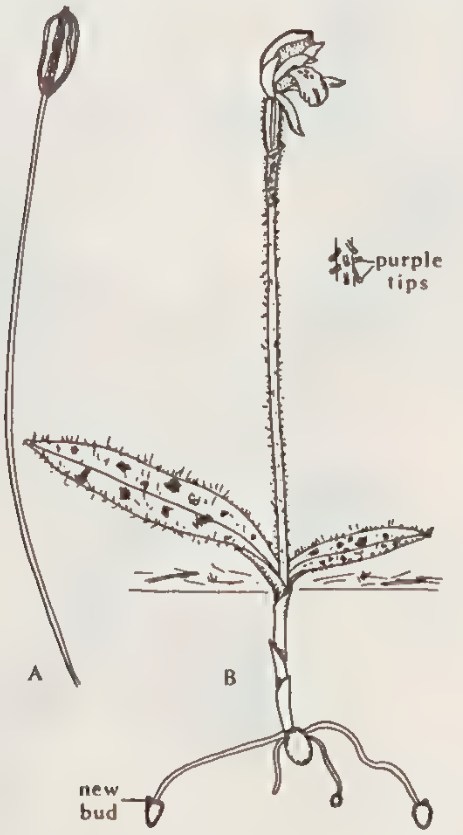
It is a terrestrial orchid with two distinctive leaves. One is usually larger than the other, giving it its common name of the odd-leaved orchid, and the leaves are irregularly blotched with red-brown patches so the plant is easily recognised even when not in flower. Leaves, stem and floral bract are very pubescent, usually thickly covered with glandular tipped hairs.

Its underground globose tubers are similar in habit to those of *Chiloglottis,* new ones are produced some distance from the parent plant, on the ends of lateral roots.

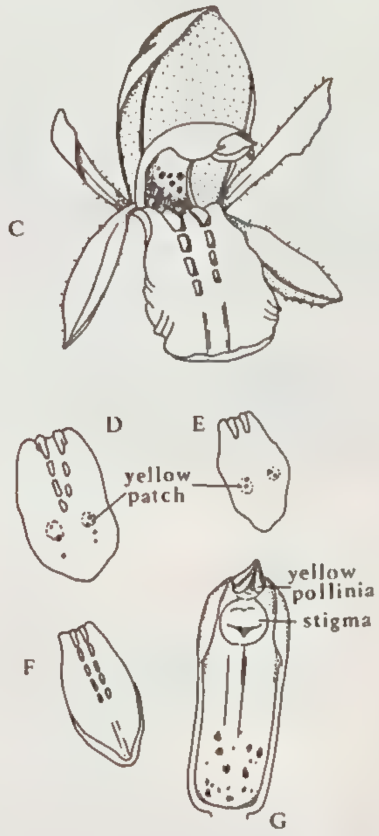
Average height is 12-15cm although its original description describes it as growing to 25cm. The white flower is about 2.5cm in diameter, has fine hairs on its outer surface and is held well above the dull green leaves. These usually lie flat on the growing medium unless it is too shaded when the leaves will be more upright. As the plant matures the stalk elongates so that the two leaves separate more on the stem. The lower leaf at 10cm is often nearly twice the length of the upper, and is about 2cm wide at its broadest point. There is a prominent mid-line.

There is a conspicuous green floral bract also usually marked with brown blotches, beneath the flower. The broad dorsal sepal which is often lemon in colour on opening but turns white, arches over the curved column, while the lateral sepals and petals are narrow, the petals being narrower and slightly shorter. There is often a purplish-pink stripe along the midrib on the back of the sepals which shows through to the front.

Aporostylis bifolia Rupp et Hatch



A — seed pod, B — flowering plant



C — flower enlarged, D,E,F — variations in lip
G — column enlarged

(Drawings: Dorothy Cooper)

The broad petal-like labellum is not divided into lobes but is variable in shape (see diagram). It is white and usually has two bright yellow patches with a few small dark red-brown spots showing up well on its anterior portion. The yellow calli in the throat or on the lip of the labellum are also variable. Sometimes there are only two basal calli, sometimes two irregular with three or four median basal calli down the lip, but usually there are two larger paler yellow basal calli and two more or less regular median rows of darker yellow smaller calli down the anterior portion of the lip.

The column is spotted at the base, has a terminal anther with finely granular pollen, the pollinia occurring two in each cell. A discoid stigma often with a deep depression in the centre occurs high on the column just below the anther. The lateral column wings join in front at the base, are widest at about the level of the stigma and have a small pointed lobe on each side of the anther.

Habitats are varied. It grows in upland areas, and is common in thick mats of wet moss so that the pseudobulbs and roots have no contact with the soil beneath. Conversely in sub-alpine and alpine areas it grows on dry stony ground amongst tussock and low alpine plants. It is also common in damper boggy areas or on relatively dry ground under low *Dracophyllum* scrub. Several old dried seed heads on elongated stalks were found from the previous year showing that the plants must seed fairly readily and although in a good season the plants may form dense carpets in suitable situations, in higher alpine areas it is more common to find solitary scattered flowers.

Under cultivation it would need to be kept damp presumably all year round as precipitation in most of our alpine areas is rather high even in summer, while in winter the ground would be snow covered.

14 Avalon Crescent
Lower Hutt, New Zealand

CHROMOSOMAL AND MORPHOLOGICAL INVESTIGATION OF TWO BULBOPHYLLUM SPECIES

by Rayden A. Rivett

(This paper is a preliminary report on work carried out at Macquarie University as part of a degree course requirement. The author emphasises the preliminary nature of the investigation and that it requires much more work for a complete appraisal of the subject and the present results. As research of this kind has been very limited in respect of Australian native orchid species and hybrids, we hope to see more on the subject as it becomes available.)

Abstract: *Bulbophyllum crassulifolium* (A. Cunn.) Rupp and *Bulbophyllum aurantiacum* F. Muell. were investigated chromosomally and morphologically. The closely related *Bulbophyllum gadgarrense* Rupp was investigated chromosomally only. The diploid numbers for each species were consistently $2n = 36$ ('n' is the symbol for the basic irreducible number of chromosomes of an organism. Orchids, like most organisms, are usually diploid, with 2 sets of these chromosomes (2n). However, polyploids may have 3 or more of these basic sets; thus triploid is symbolised by 3n, tetraploid 4n, etc.), while tetraploids of *B. crassulifolium* were $4n = 72$. A computer analysis using vegetative characters of *B. aurantiacum* and *B. crassulifolium* clearly separated the two species into distinct groups thus proving these species are morphologically different.

INTRODUCTION:

The genus *Bulbophyllum* is the largest within the family Orchidaceae with about 2,000 species and varieties (Dockrill 1969). Their distribution includes many tropical and sub-tropical areas and some temperate areas. In Australia 23 species are known to occur (including the two recent discoveries by Lavarack - see Orchadian Vol. 5, No. 11, 1978).

Two closely related species, *B. aurantiacum* F. Muell. and *B. crassulifolium* (A. Cunn.) Rupp of the section Polyblepharon have been easily confused because of their very similar floral and vegetative structures. The large variation in these features, particularly in *B. crassulifolium* is clearly reflected by the number of synonyms each species has (see Dockrill 1969).

The necessity to review the two species was pointed out by Clemesha and Upton (1964) when they discussed the relatively subtle differences between the two. Hence the author decided to investigate further differences or similarities that possibly existed between *B. aurantiacum* and *B. crassulifolium* cytologically (ie. chromosomally) and vegetatively (or morphologically). At the same time *B. gadgarrense* would also be studied since it too has been wrongly recognised in Northern Queensland as *B. crassulifolium.* (Clemesha and Upton 1964)

Cytological studies of Orchidaceae have been used for perhaps the last twenty years. Chromosome number, size and shape as well as pairing at meiosis, often serve in establishing the degree of relationship among species (Tanaka and Kamenoto 1961). Unfortunately these studies have been largely restricted to commercial and exotic species and hybrids (ie. "horticulturally desired"). Australian native orchids are indeed lacking so far as this type of knowledge is concerned and only a small amount of research has been carried out (eg. Maxwell 1969). Although this present work is small, the author hopes it will put light on a neglected aspect of our indigenous orchids.

METHODS AND MATERIALS:

The chromosome staining procedure is one slightly modified from that of Maxwell (1967). The major modification is the use of 1:1 95% ethyl alcohol and concentrated hydrochloric acid for hydrolysis and then 45% acetic acid; both for 5 minutes at room temperature.

Actively growing root tips were severed in most cases but where this was not possible, flower buds or leaf meristems were used. The treated tissue was squashed and mounted and examined under a microscope at about 400x. Suitable cells with chromosomes in the desired stage of mitosis (metaphase) were photographed under 1000x magnification, enlarged and the chromosomes counted.

Four vegetative characters were selected for a morphometric discriminate analysis. These were: leaf length, width, internode distance and leaf groove angle. The measurements from samples of both *B aurantiacum* and *B. crassulifolium* were converted for use in the computer and a BMD 04M computer programme for discriminate analysis of two groups was applied to them.

OBSERVATIONS AND DISCUSSION:

Fig. 1, *Bulbophyllum crassulifolium:* It was determined that the chromosome number in diploid cells was 36 for this species (fig. 2).

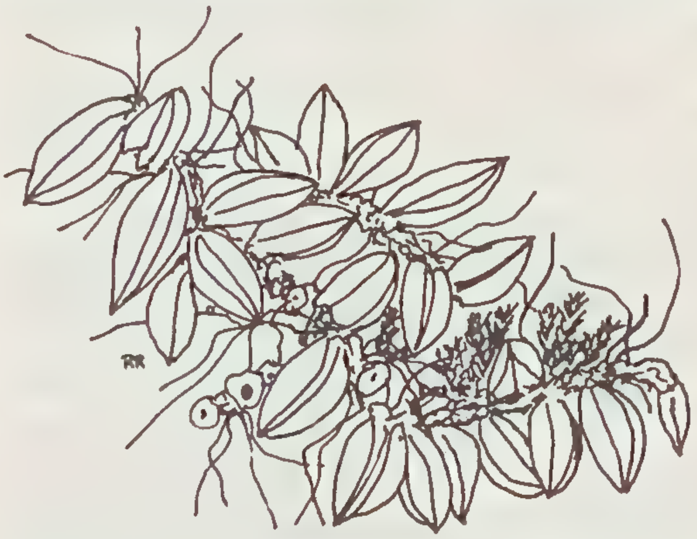


Fig 1: Plant of *B. crassulifolium* from MacDonald River, N.S.W. (life size).

The size of the chromosomes ranged from approximately 1.2×10^{-6}m. to 8.0×10^{-10}m. in total length. Tetraploid forms of *B. crassulifolium,* $4n = 72$ (fig. 3) were noticeably different morphologically from the normal diploid clones. One tetraploid plant (fig. 4) closely resembled *B. aurantiacum* by having large leaves and most importantly, a partial pendulous habit which has been used extensively to separate the two species taxonomically. In general, the tetraploids were a larger growth with fleshy leaves usually greater than 2.5cm long, a deep channel or groove and always thick.

Fig. 5, *Bulbophyllum aurantiacum:* The chromosome number for *B. aurantiacum* was not so easily determined because of the difficulty in stopping the cell division at the desired stage.

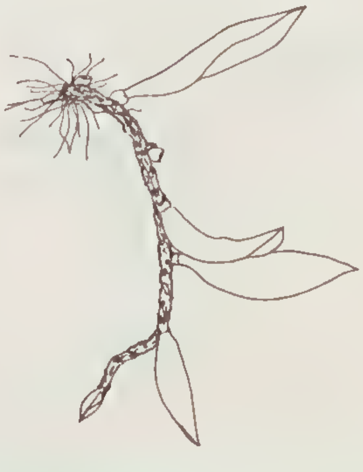


Fig 5: *B. aurantiacum,* (disorientated)

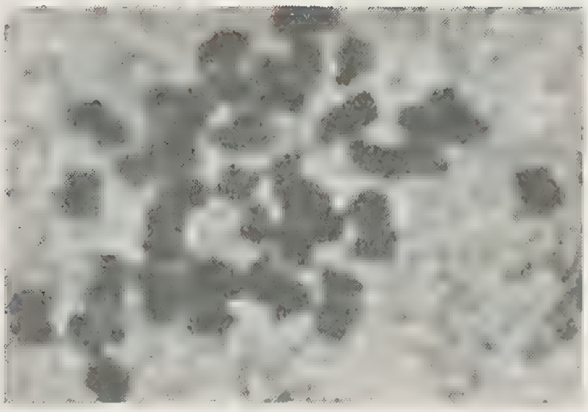


Fig 2: Chromosomes of *B. crassulifolium*, 2n = 36 (x6000)

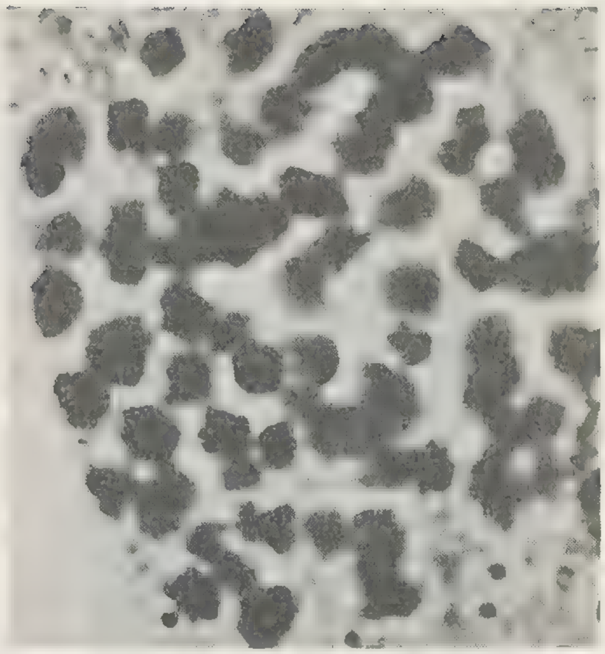


Fig 3: Chromosomes of a tetraploid *B. crassulifolium* 4n = 72 (x6000)

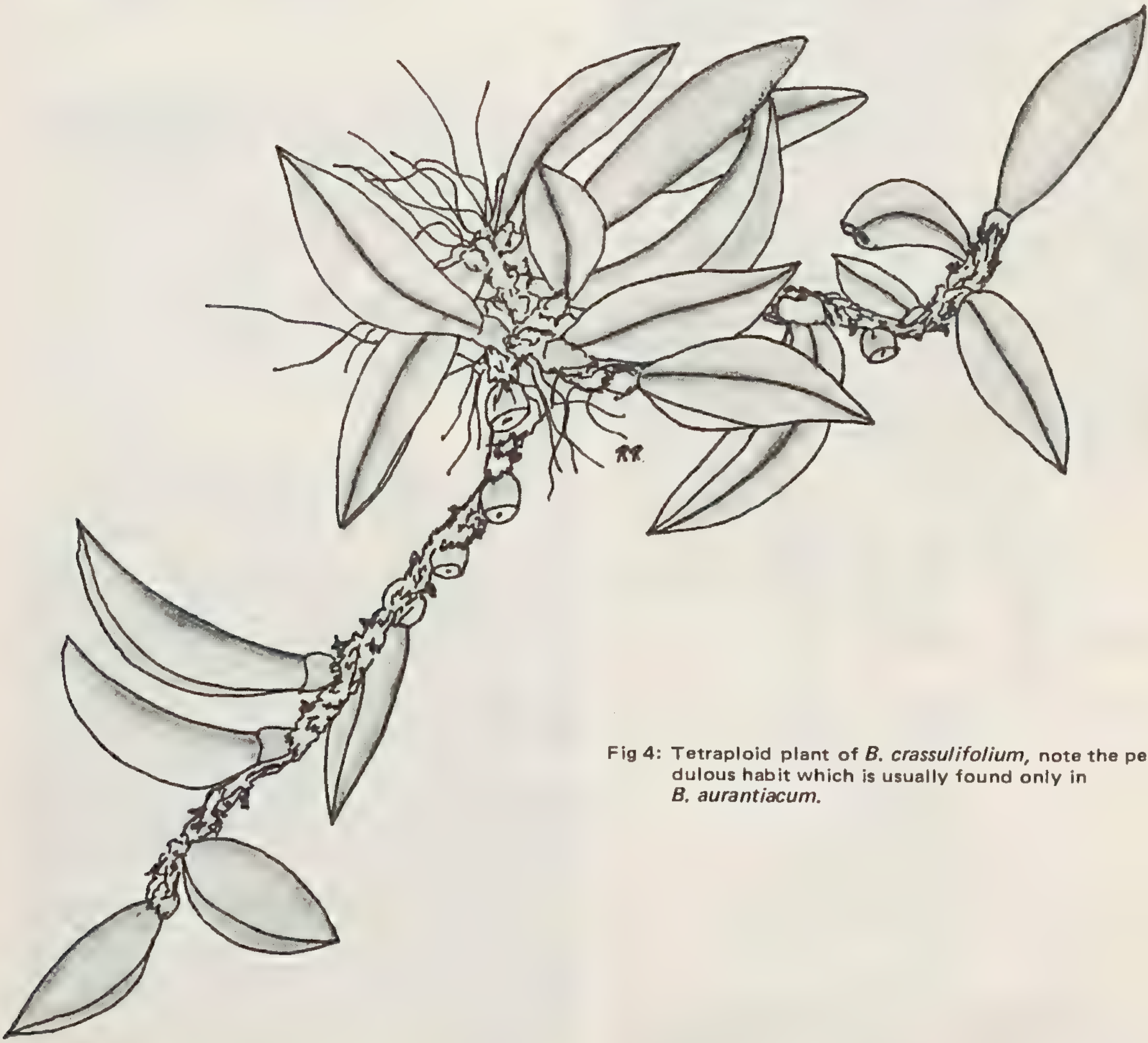


Fig 4: Tetraploid plant of *B. crassulifolium*, note the pendulous habit which is usually found only in *B. aurantiacum*.

The chromosomes were often obscured though preliminary counts were 2n = 36. The mere reason that the two species exhibited different degrees of cytological results may reflect some divergence of relationship.

Bulbophyllum gadgarrense: Again 2n = 36 and the size range was identical to *B. crassulifolium,* ie. 1.2 x 10^{-6}m to 8.0 x 10^{-10} in chromosome length (fig. 6). The chromosome number, size and shape of *B. gadgarrense* are almost identical to *B. crassulifolium* which may indicate a very close genome relationship between the two.

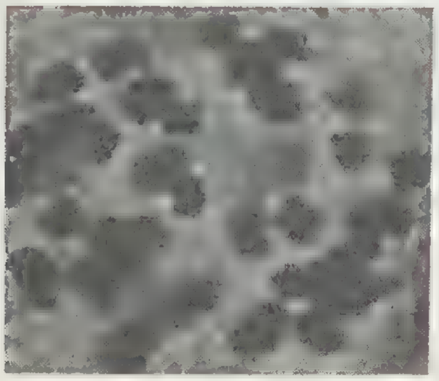


Fig 6: Chromosomes of *B. gadgarrense,* 2n = 36 (x7000)

Numerical taxonomy has been successfully applied to many plants because it has the outstanding aim of repeatability and objectivity. Unfortunately only vegetative characters were selected, basically because flowers were not out for both species during the investigation period. The author personally does not agree that these characters alone should be used for taxonomic purposes but instead that as many characters as possible should be used, including flowers. Vegetative structures can vary with the environment. We have seen what happens to leaves when grown in, say, a darker situation. Flowers on the other hand are primarily genetically controlled, with less variation than the vegetation and are less affected by the environment because the flower is a highly evolved reproductive mode that must stay constant for the success of the species.

The computer analysis of the four characters clearly divided *B. aurantiacum* and *B. crassulifolium* into separate species with a certainty of 99.75% that each sample was correctly assigned to the right group. The character that weighed most on the analysis was leaf width, (fig. 7) *B. aurantiacum* having a wider leaf than *B. crassulifolium.*

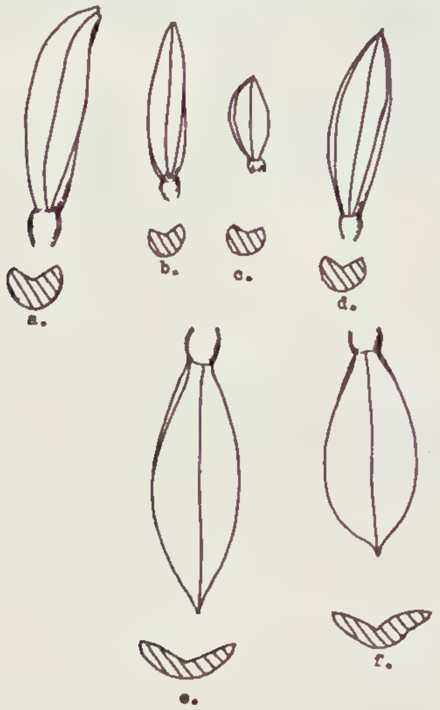


Fig 7: Leaves and leaf cross-section are from plants of various locations. a. to d. *B. crassulifolium,* a and d are tetraploids. e. and f. are *B. aurantiacum.*

Unfortunately no real idea of genetic relationships between *B. aurantiacum* and *B. crassulifolium* was reached; however, the morphological differences did discriminate each species using the already mentioned characters, *B. gadgarrense* and *B crassulifolium* surprisingly had close genetic proximity. Both had similar chromosome number, size and shape but the phenotypic (or the plant morphology) differences were sufficiently substantial to warrant individual species classification (see Clemesha and Upton 1964).

To remain distinct species, *B. crassulifolium* and *B. aurantiacum* need to have some type of reproductive isolating mechanism operating so that no hybridization can occur between the two. This is necessary because over much of their distribution they grow sympatrically (in the same area). Hybridization is thought to be the reverse to speciation by Grant (1971) and species tend to prevent it happening. The reproductive structures of *B. crassulifolium* and *B. aurantiacum* are very similar and one possible method of ecological separation may be seasonal isolation. In this way each species is separated by a time barrier in flowering, ie. one is in flower while the other is not. To some extent *B. crassulifolium* and *B. aurantiacum* exhibit this behaviour (see fig. 8) though the author has never observed it.

KEY TO FREQUENCY OF FLOWERING

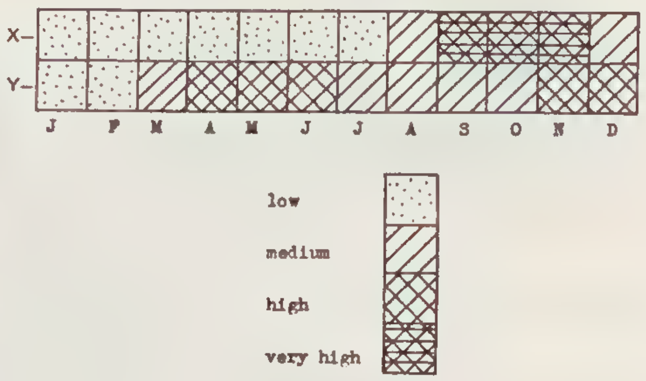


Fig. 8: Flowering times of both species. (January to December.)

X = *B. crassulifolium,* Y = *B. aurantiacum*

Ethological isolation has also been known to occur where the pollinating insects are highly species specific (only visit the one species). Clyne (1972) suggests most Australian *Bulbophyllums* are myofilous (pollinated by flies) but it appears unlikely that these two species would have ethological isolation since the flowers are so similar.

Habitat may also separate the two species, where one may prefer a slightly different environment from that of the other, thus providing a small geographic barrier.

Should any reader wish to comment further on either of the species concerned, through the *Orchadian,* please feel free to do so. Observations on fertilization, habitat, etc. would be most useful for a complete understanding of relationships between these Bulbophyllums.

ACKNOWLEDGEMENTS:

The author wishes to thank all those associated with course 02334 at Macquarie University for assistance with equipment etc., while thanks must also be given to the people who so generously supplied plant material, namely Messrs. W. Upton, P. Hind, N. Stockton, and D. McVicar and Mrs L. Cardiff. Though not mentioned, many more gave assistance in some way and their help was much appreciated.

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33 Woodland Street
Baulkham Hills, NSW. 2153

AUTUMN CULTURAL NOTES — 1979

Dear Orchadians,

How soon the years rush by as we get older; Christmas has come and gone again, and it seems only a few weeks since Christmas '77 was with us. I remember when I was tiny very well, and in those days it seemed to be years from one Christmas to the next.

The year gone by has been a year of promises as far as my native orchids are concerned; I have been going to give them a new house ever since the March '78 floods wrecked their old one but I still have not got around to it. My poor bushhouse has had to take second place to the business of getting the farm going again, as the old income has to be first on the list at times.

I am feeling a bit cheesed off with some of the human race at the present time and I think I will tell you the reason why. On the bottom end of our farm are two beautiful River Oaks that are years old and over twenty metres high, and on these oaks were five beautiful clones of *Dendrobium teretifolium* and one big *Dendrobium beckleri.* These were an absolute picture in flowering time and had been seen and admired by orchid lovers from all over Australia and as the two bigger *Dendrobium teretifolium* were only a little over two metres off the ground they were no strangers to cameras either.

On my way round the farm not long ago I went to inspect them for dendrobium beetle and found that some clot had taken them all except two baby *Dendrobium teretifoliums.* I only hope that whoever took them at least makes some effort to grow them.

As anyone can see from the start of this article I am easily distracted and this is supposed to be a cultural note, I had better get back on the track or the editor might disown me.

Autumn is always such a glorious time of the year that I would love to be able to down tools and just drive through my home mountains and watch Nature go about her wondrous task of eternally organizing the demise and regeneration of her realm. To stand on a mountain top and watch her go about her business makes one realise just how puny we humans are in comparison with her.

This has been one of the best years I have known for growth in native orchids and I hope yours have done just as well for you. It is always nice to approach winter with a beautiful crop of new canes hardening off; and all just bursting with the promise of next Spring's myriad bounty to come.

At this time of year most of the chewing types of insects have just about given up for the season, but keep on spraying for a while till the weather has definitely cooled down or you may end up getting a lot of those new canes eaten out before they even get a chance to flower. I think more flowers are lost in the autumn and early winter from insect and slug and snail damage than most growers ever realize; I have seen many collections where native orchids are only flowering to twenty or thirty percent of their potential just for the want of a little bit of maintenance attention in the off season. You haven't got to live with your plants but there is a certain amount of maintenance that must be done at the right time for optimum results. I think most orchid growers are perfectionists at heart, and in the artificial conditions we make for our plants we must be prepared to give Nature a helping hand if we want the perfection.

I had a good example of this with my *Sarcochilus falcatus* this year: as you have read in my earlier notes I have always recommended that all *Sarcochilus* be fed all the year round, but this winter just gone mine hardly got fed at all as I was away working quite a bit and the result was that even though we had hundreds of flowers a lot of them were nowhere near the size of flowers that I know the plants can produce. The lack of fertilizer did not seem to affect the length of raceme or number of flowers, only the size of the flowers. Anything that was more than five feet off the ground (flood level) flowered superbly this year.

Any of the trace element type fertilizers are ideal for all native orchids in my experience: just add a high nitrogen fertilizer at the peak growth period and you will be helping your plant towards that perfection we were talking about earlier. I have used R.D.O. (R) for years with top results. Pardon my slip there, it is now sold as Field Pack (R). There may be others that will do a better job, but it would take years to try them all, and while one is getting satisfaction why change?

This same outlook applies to all facets of plant growing; that is if you are happy with your system of culture don't change under any circumstances, it is only if you are not getting good results that you should cast about and try something else.

If ever you have trouble, don't be afraid to ask another orchid-grower or write for assistance, as at times an extra pair of eyes or opinion can be of great help, and on top of this, most orchid growers are only too happy to help anyone with a common interest.

I think I will leave you now and let my thoughts return to the mountains, Mother Nature and that glorious tang of Autumn and approaching Winter.

Good growing till next time.

Ted Gregory
RMB 201, TAREE, NSW 2430

P & M ORCHIDS

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A plant (or division) of
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TAXONOMY AT WORK –

Glomera and *Glossorhyncha*

– by John S. Womersley

Among the many species in collections of orchid plants from the wilds of Papua New Guinea there are usually many plants loosely identified as belonging to the genera *Glomera, Glossorhyncha* or *Giulianettia.* The genus *Glomera* was first described by Blume in 1825 for the species *Glomera erythrosma* found in Java. The generic name alludes to the compressed inflorescence whereby the individual flowers appear to be aggregated into a head, i.e. in technical language, glomerate. The genus *Glossorhyncha* was created for the Ambonese plant which Ridley, in 1891, named *Glossorhyncha amboinensis.* The genetic name refers to a 'tongue-like beak' which Ridley thought he saw as a prolongation of the rostellum. In 1908 J.J. Smith and subsequently other botanists have shown that the rostellum in normal flowers of *G. amboinesis* is no more than 'rounded and shortly retuse'. Rolfe, in 1889 created the generic name *Giulianettia* for the species *G. tenuis* from New Guinea. This generic name honours the Italian geographer and botanical collector Giulianetti, who, between 1889—1897 travelled widely in south-east New Guinea as a travelling Government Agent for Sir William MacGregor, Lieutenant Governor of Papua. His collections of some 120 specimens are held in the Melbourne and Kew Herbariums with a few others elsewhere.

The barons of orchid taxonomy in the early 1900's, (J.J. Smith working in Java and Rudolf Schlechter, who combined extensive field work in New Guinea and other parts of the world with periods of intense herbarium work in Berlin,) differed in their acceptance of the generic distinctions between *Glomera, Glossorhyncha* and *Giulianettia.* Publications show that the moment one described a species in *Glossorhyncha* or *Giulianettia* the other transferred the specific epithet to *Glomera* and vice versa. Only the professional taxonomist can fully understand the extent of confusion which resulted from the differing views of Smith and Schlechter, as each proceeded to describe new species from the rich collections then becoming available from New Guinea, the Dutch East Indies and South Pacific.

Dr Pietr van Royen, Botanist at the Bishop Museum, Honolulu, is working on the preparation of an Alpine Flora for New Guinea. During this work he has had to unravel the tangled nomenclature of the species placed in the genera *Glomera, Glossorhyncha* and *Giulianettia.* As a result of his research he published a paper in the journal *Folia Geobotanica et Phytotaxonomica* (1974) vol. 9, p. 77-85. This journal, which is published in Prague, Czechoslovakia, is not, as far as can be ascertained, taken by any of the scientific libraries in Australia. It is only because botanists exchange reprints of their research papers one with the other that my attention has come to this paper.

As yet no species from Australia have been described in any of the three genera. Plants of these genera are frequent among collections made by visitors to the mountains of Papua New Guinea so it is therefore worthwhile to outline the results published by van Royen and to describe in practical terms the distinctions between these genera. van Royen examined in detail the history of the confusion and considered the status of each genus and the species ascribed to it.

During the late 1800's and early 1900's *Glomera* was accepted by botanists as having capitate inflorescences surrounded by several involucral bracts. The individual flowers are in general small with sepals and petals which do not spread widely. The flower colour is usually white to yellow, often with a brighter orange cap on the column. The leaves are lanceolate and often moderately long. The plants are robust with a number of stout, fibrous pseudobulbs.

Glossorhyncha was recognisable by the always solitary flowers which are relatively large and pure snow-white in colour. The petals and sepals spread widely while the bracts, if present below the flowers, are no more than two in number and do not constitute an involucre. The leaves are generally narrow and short, often rigid. The plants are slender and the pseudobulbs can be described as flexuose.

So far so good; everything appears to be nicely separated and compartmentalised when along comes *Giulianettia tenuis* Rolfe. This plant has flowers in which the sepals and petals are fleshy, and although widely spreading, the petals are narrow. Schlechter, in 1914, admitted that the distinctions by which *Giulianettia* was separated from *Glossorhyncha* are very slight. He continued to maintain the separation of *Glomera* from *Glossorhyncha* although J.J. Smith objected to this and placed all species formerly assigned to the three genera in *Glomera.*

In his researches into this complex van Royen soon recognised that there were some basic distinctions between the generic assemblages not seen by Schlechter and Smith. Through the greatly increased amount of material now available from recent collections it was possible to review the situation rationally. Species which were generally placed in *Glomera* all had four (very rarely only 2) or more inflorescences aggregated into a head. Each inflorescence has one bract, which, while clasping the stem of the flower, is not tubular. In the species generally placed in *Glossorhyncha* there is always a single inflorescence with a single flower and two bracts which are tubular. This is the condition found also in *Giulianettia.* Further differences in the sheath of the leaves has also been observed.

van Royen recognises that the genera *Glomera* and *Glossorhyncha* should be maintained as distinct and that *Giulianettia* is to be reduced to a synonym of *Glossorhyncha.*

There are 48 species of *Glomera* described and of these 38 are from New Guinea; the 81 species of *Glossorhyncha* include 75 species from New Guinea. The remaining species in each genus are thinly scattered through Java, Mindanao, Ponape, the Bismarck Archipelago, Solomon Islands, Fiji and Samoa. In addition to these named species van Royen considers that the present collections include a number of as yet un-named species. In his paper van Royen provides a full listing of all specific names which have been published in *Glomera, Glossorhyncha* and *Giulianettia* and his interpretation of the correct status for each specific epithet.

For the connoisseur of botanical species the following distinctions will allow the correct identification to genus. Further work at species level must await publication of later studies by van Royen.

Summary of distinctions between *Glomera* and *Glossorhyncha* according to van Royen:

> *Glomera* Blume, Bijdragen tot de flora van Nederlandsch Indie, 1825: 372, f. 68. Sheaths of leaves with, at the tip, a limb-opposed tooth, rarely this one absent, sometimes with a few bristles. Inflorescences 4- many rarely 2, each with a single flower and with one bract along the peduncle. Involucral bracts enveloping the heads. Peduncular bract strongly amplexicaulous or not, open. Lateral sepals usually connate at the base, sometimes to the tip, sac-like, enveloping the spur.
>
> *Glossorhyncha* H.N. Ridley, New East Indian Orchids, – Journ. Linn. Soc. London, 1891, 28:244, t. 44. Sheaths of the leaves at the tip usually with a bundle of glabrous or warty bristles, rarely these not or hardly developed, sometimes with a leaf-opposed tooth. Inflorescences 1 only, 1-flowered with two bracts. Both bracts tubular, enveloping each other and the ovary, sometimes also enveloping the spur. Lateral sepals usually free at the base, rarely forming a tube around the base of the spur.

Source: van Royen P. Folia Geobot. Phytotax., Praha 1974) 9:77-85.

82 Richmond Road
Westbourne Park, S.A. 5041

Letters to the Editor

Dendrobium x goldiei

Dear Sir,

I seek your help through the pages of "The Orchadian" in establishing the correct classification of an orchid known to me as *Dendrobium goldiei.*

I have such a plant and am enclosing a copy of a coloured slide of the flower which, it is hoped, will help in this endeavour.

As can be seen from the photo, the floral segments are similar in form to those of *D. bigibbum* but the plant itself is more robust. The pseudo-bulbs can be 50cm or more in length, slightly fusiform and thickening to about 1.5cm at the middle. As can be seen, the sepals have a white margin; this feature is outstanding in the darker colour form. The formation of its leaves is similar in outline to *D. bigibbum* but they are much larger and have more substance and therefore more rigid. There is no reddish outline to the leaves as there is with *D. bigibbum.*

The plant grows and flowers quite readily in the Sydney area but requires some heat over the winter period, flowering in early to mid autumn in glass house conditions.

In "Australian Indigenous Orchids" A.W. Dockrill briefly mentions *D. goldiei* on page 447 but excludes it as an Australian plant presumably because it has not been recorded as having been collected from anywhere on the Australian mainland "only on Darnley Island and some other Torres Strait islands".

In the "Australian Orchid Review" Vol. 31, No. 1 (March, 1966), page 31 *D. goldiei* is mentioned in the abbreviated account of the "Cooktown Orchid" by Dr S.T. Blake. In his detailed study of this orchid and its variants, Dr Blake mentions *D. goldiei* as a possible back cross to *D. discolor.* As I see it, he meant that *D. goldiei* could be the result of *D. x superbiens* being crossed back to *D. discolor.* If *D. goldiei* was the result of such a mating, there is every indication it would have twisted or undulate sepals and petals, but this is not so in my plant.

Is the plant under discussion in reality *D. bigibbum var. venosum* (See "Australian Indigenous Orchids" page 454)? Perhaps it will be necessary to have a taxonomical examination of the flower before identification of the plant can be established.

May I suggest that Mr Don Blaxell of Sydney's Royal Botanic Gardens may be able to shed some much needed light on this subject?

Don Barnham
1 Belmore Rd., Peakhurst, 2210

Mr Blaxell's Reply:

From the photograph of Mr Barnham's plant (flowers only) which I examined, I concluded that his plant is most likely *Dendrobium bigibbum var. venosum.* I say "most likely" since an examination of fresh flowers would need to be made to check some of the details of the labellum, which, of course, are not evident in the photograph.

However, it may not be possible to positively name this plant, except to say that it is most likely the result of natural (?) hybridisation between *D. bigibbum & D. discolor.* By this, I do not mean the result of a primary cross between the two, but most certainly the result of several backcrossings to either parent. The "bigibbous" nature of the flower (i.e. its two "chins" or horns) and the lack of "twisting" of the tepals leads me to suspect that this plant has more *D. bigibbum* in its genetic composition than *D. discolor.*

From an examination of the drawing in the *Gardeners Chronicle (1878),* I do not think that it is *D. x goldiei,* but I would agree that it could be classed as an Australian native.

D.F. Blaxell
Senior Botanist

SELECTIVE BREEDING AND GENETICS

Dear Sir,

I was interested to read in the Orchadian (Vol. 5:170, 1978) of a cross between two white forms of *Dendrobium kingianum,* performed by Ted Gregory. I was also pleased to see the curiosity it aroused when Norm Stockton attempted to explain the genetics of the cross (Orchadian 6: 21, 1978). Norm's explanation used basic Mendelian inheritance of a single gene. However, it appears that the cross may be a good deal more complex than this.

Briefly, the cross was as follows:

White flowered form (1) X White flowered form (2)
This yielded 85% pink flowered plants, 15% white flowered plants. This implies a phenotype ratio of about 5:1 (or possibly 6:1) of pink to white flowered plants respectively. However, for a simple Mendelian cross, a ratio of 3 white : 1 pink would be expected — the reverse of the apparent observed ratio. Also, the expected ratio of 3 white : 1 pink could only occur if the allele for white flowers was dominant over that for pink flowers. If the white allele were recessive, then all the progeny would be white. Furthermore, if this were a co-dominant situation, as proposed by Norm Stockton, where neither allele was dominant, then three phenotypes (white, pink and one intermediate colour) would be expected in a ratio of 1 white : 2 intermediate : 1 pink.

Thus, since single gene modes of inheritance cannot explain the cross, and since there are only two phenotypes (colours) among the progeny, this appears more likely to be a case of epistatic gene interaction, i.e.: the interaction of two or more interdependent genes. However, there are a number of such interactions and the effects of each may be further complicated by other factors such as polyploidy, complex colour inhibitor genes, or differential viability of seedlings and so on.

Exactly which mode of inheritance has caused the observed result cannot be determined, since the exact number of plants grown from the cross is unknown. This is very important as the number of progeny will affect the degree to which chance deviation from expected values and ratios may reasonably be expected. This simply means that if Ted's cross produced 100 seedlings and 85 of them grew to produce flowers, he has indeed observed a very interesting genetic phenomenon. However, if he only had 6 or 7 seedlings which grew to maturity, his results would be virtually uninterpretable.

Nevertheless, Ted's cross does appear interesting and if more precise information were available I would be glad to try and analyse it more thoroughly. This analysis would require not only a complete description of the cross, parents and progeny, but also exact numbers of progeny with pink flowers and white flowers respectively. No analysis can be made on the basis of percentage alone.

The genetics of orchids is not only an interesting topic, but a useful one to anyone attempting any form of selective breeding. However, it is largely neglected due to the amount of time and space required to conduct extensive tests and trials. This problem can only be overcome with the concerted effort of many people. An effort in which I would be very glad to participate.

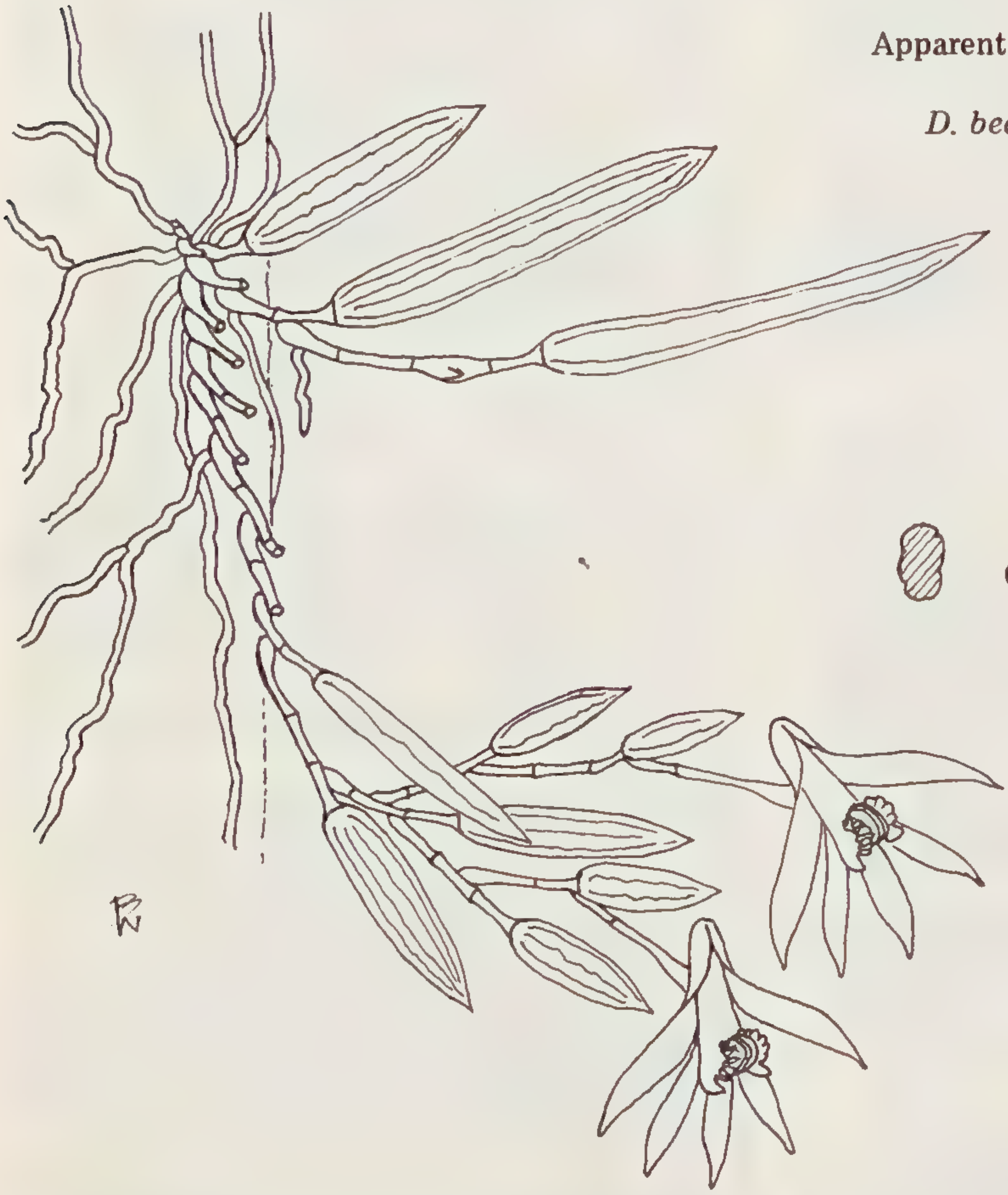
Yours orchidaceously,
PETER BROWN
14th December, 1978

210 Burgundy Street
Heidelberg, Vic. 3084

INTROGRESSION AMONG AUSTRALIAN FLESHY-LEAFED DENDROBIUMS

by B.J. Wallace

In connection with my degree project on the Australian epiphytic flora I was investigating a strangler fig, *Ficus watkinsiana,* emergent above the general canopy of the subtropical rainforest at Dorrigo in September, 1978. It carried a remarkably rich epiphyte flora including seven species of fern, five miscellaneous dicots, nine cryptogams and nine orchids, as well there were seven vine species climbing on it. The orchids were: *Bulbophyllum crassulifolium, B. exiguum, Dendrobium beckleri, D. gracilicaule, D. pugioniforme, D. speciosum, D. teretifolium, Liparis coelogynoides* and *Sarcochilus falcatus.* Both, *Dendrobium beckleri* and *D. pugioniforme* were particularly common on the tree and although optimally, their microhabitats are slightly separated *(D. beckleri* preferring more exposed sites), they were growing side by side in many cases. In this context, I discovered a plant that I assumed was a hybrid between these two species since it was intermediate in many observable characters, especially in regard to leaf morphology and plant habit. Such a hybrid, or perhaps more correctly, putative hybrid, has been recorded previously, on rare occasions (see A.N.O.S. *Checklist of Aust. Native Orchid Hybrids,* 1977), although apparently not described or discussed.



Apparent natural *Dendrobium* hybrid

D. beckleri X D. pugioniforme

Cross section of leaf

Scale: approximately full size.

The plant in question came to notice firstly because of its growth habit. It was neither erect nor pendulous, but porrect, that is, ± horizontal growth and thus intermediate between the supposed parent species. Leaf size is roughly constant in *D. pugioniforme* but in *D. beckleri,* is larger at the basal or proximal end of the sympodium (c. 5-15 x 0.5-1 cm), decreasing with increasing distance from the base to a few mm in length and barely thicker than the stem. This effect obtained in the hybrid but to a much reduced extent and terminal leaves, where flowering occurs, were proportionately larger than in *D. beckleri.* Except that they were broader for a given length, flattened somewhat (see diagram of leaf T.S.) and had sharper apices, the leaves more closely approached the shape, colour and texture of *D. beckleri.* In a few instances roots arose at some distance from the base of the plant — more so than in *D. beckleri* but not as freely as *D. pugioniforme.*

The plant had two flowers and these had shorter, broader segments than *D. beckleri* but longer and narrower than *D. pugioniforme,* in colour they were slightly more intense green than *D. beckleri.* Details of the column and labellum of these two species are very similar and the hybrid did not vary significantly here.

The flower of *D. tenuissimum* is also very similar to these two; indeed, those of the other fleshy-leafed Australian dendrobiums of the same series are not greatly dissimilar in morphology, especially when taking into account the normal range of variation within each species. There are records of rare occurrences of natural hybrids between many of these species which have sympatric ranges. They are (basically from A.N.O.S. 1977 loc. cit.):

D. beckleri x teretifolium, tenuissimum, pugioniforme and *striolatum*[1]; *D. linguiforme x teretifolium, cucumerinum, racemosum* and *rigidum; D. teretifolium x striolatum; D. tenuissimum x pugioniforme; D. mortii x cucumerinum; D. pugioniforme x striolatum*[2]. *D. cucumerinum x striolatum* is recorded as an artificial hybrid; there appears to be no record of any hybrid including *D. wassellii* as a parent.

Apparently, then, there is some degree of interfertility between most species of the group and from knowledge of artificial crosses of some of them, the extent of this is more than minimal. Thus, the question arises as to why hybrids between members of this group are so uncommon or why introgression is not more extensive.

Orchid species isolation mechanisms include: 1. Lack of interfertility (itself divisible into various factors); 2. Geographic separation or allopatricity; 3. Ecological separation, i.e. plants growing in separate microhabitats within the one community, such that pollinators are excluded from one, or that hybrid seedlings are not adapted to either, or any other available microhabitat; 4. Phenological isolation — different species not having overlapping flowering seasons; 5. Pollinator specificity — specific pollinators only attracted to specific orchid species, or; 6. Pollination mechanism — in some instances, e.g. in some South American orchids, interfertile species that grow and flower together are pollinated by the same bee species but are prevented from hybridising because the pollinator orients itself differently in each species' flower — the pollinia are attached to different parts of its body.

In many cases of the Australian fleshy-leaved dendrobiums, mechanisms 1-4 do not apply and it seems that the maintenance of species integrity here, must relate to some aspect of pollinator behaviour. Unfortunately, our knowledge here is quite deficient. In this genus, (in Australia) the pollinators of *D. smillieae, D. speciosum* and *D. lichenastrum* are known (a honeyeater and two bee spp., resp.) and a small amount about their behaviour.

Aside from 'windfall' sightings, successfully observing such phenomena can be, as one knows from personal experience, a tedious and somewhat frustrating activity, but the gain of such information is important, even crucial in the understanding of the evolution and biogeography of orchids.

Accordingly, any reader who has made any pollination observations, and wishes to co-operate in such a study, is invited to send them to the present writer, in as much detail as possible; these would be adequately acknowledged.

B.J. Wallace, Botany Department,
University of New England,
Armidale, N.S.W. 2351.

1) Implies an extension of the recorded range of either *D. beckleri* or *D. striolatum* (but see also *Orchadian*, Vol.5, No.12, p.185, letter from S.C. Clemesha, correcting an error in the ANOS *Checklist* which imputed discovery of such a natural hybrid to Clemesha. — Editor.)
2) K. Hill, pers. comm.

AUSTRALIAN ORCHID FOUNDATION

Seed Bank

The A.O.F. seed bank is pleased to list the following orchid seed available for distribution. The A.O.F. accepts seed from reputable persons known to it, but neither the Foundation, nor the donors, can guarantee the accuracy of the descriptions.

Applications for seed must be accompanied by payment of $1 Aust. for the first sample plus 50 cents Aust. for each successive sample. All despatches will be post-free by airmail.

Some holdings of seed are very small and will be distributed on a "first come, first served" basis. Please nominate alternative species. All cheques should be made out to "A.O.F.", and all communications addressed to:

Mr L.J. Lawler
A.O.F. Seed Bank
Department of Biochemistry
The University of Sydney
N.S.W. 2006

Further details of some samples are available and will be given on despatch.

The A.O.F. is grateful to all the donors of seed, as the success of this venture depends entirely on their generosity.

Australian Species

Caladenia carnea
" *dilatata*
" *graminifolia*
" *lobata*
" *roeii*
Cymbidium canaliculatum
" " *"green form"*
" " *v. sparkesii*
" *madidum*
Cryptostylis ovata
Dendrobium aemulum
" *antennatum*
" *bigibbum*
" *dicuphum*
" *kingianum*
" *linguiforme*
" *lobbii*
" *speciosum*
" *speciosum v. hillii*
" *teretifolium v. teretifolium*
" *teretifolium*
Diuris laxiflora
" *maculata*
" *palachila*
" *palustris*
" *brevifolia*
" *pedunculata*
Eulophia pulchra
Habenaria ochroleuca
Phaius tancarvilliae
Pterostylis curta
" *nana (W.A.)*
" *nutans*
" *pedunculata*
" *recurva*
" *scabra v. scabra*
Sarcochilus australis
" *falcatus*
" *fitzgeraldii*
" *hartmannii "alba"*
Thelymitra antennifera
" *cyanea*
" *fuscolutea*
" *longifolia*
" *luteocilum*
" *pauciflora (blue)*
" *pauciflora (white)*
" *rubra*
Vanda hindsii

TERRESTRIAL CULTURE NOTES

L.T. Nesbitt

Since all of the orchids found in the South Australian bush are terrestrials, it is not surprising that terrestrials are less troublesome to grow in Adelaide than epiphytic orchids. Epiphytes require daily watering in Summer plus special facilities to prevent sunburn and dehydration. These "tree" orchids are readily available from nurseries, have been hybridised extensively, are written about constantly, and win nearly all the prizes at shows, so I will try not to mention them again.

I don't see any orchids here!

About two thirds of our Australian orchid species are terrestrial but only a few of these are commonly found in orchid collections, and even fewer are available commercially. Man-made hybrids are extremely rare, in fact I can't think of any that have been registered from the deciduous terrestrial group. The list of hybrids recently published by ANOS did not include any terrestrial hybrids although plenty of natural hybrids are known to occur. In short, terrestrials have been put into the too hard basket for too many years and I find this a disturbing state of affairs. Does your local show have more classes for terrestrials than epiphytes? It should if you look at the number of species in each group.

There is an enormous amount of work to be done on the classification, judging, culture, and hybridizing of terrestrials. The pace is very slow at the moment but it is speeding up, especially in the southern half of Australia. Since 1970 there has been increasing interest in terrestrials in all States and research projects are starting to bring scattered results. I hope the Orchadian can collect and disseminate more data on our terrestrials as they become available. Many of the workers in this field are hobbyists who probably feel that other people know much more than they do. Perhaps a few of them will write in the *Orchadian.*

These cultural notes are based on my experience in Adelaide and will need to be modified to suit the climate in other parts of Australia. Perth has a longer hotter Summer and growers there may have to take precautions to prevent excessive tuber shrivel in Summer. Burying the pots in sand or shading heavily in summer may help. Melbourne and Hobart are colder and wetter and drainage becomes very important. An open sided glass or plastic house to shed winter rain seems to give good results in these areas, but you have to water by hand. Sydney has problems with high humidity causing leaf and tuber rot, and this is probably true for Brisbane also. Some local species will do well wherever you live and you should concentrate on these at first. They may not be the biggest or the prettiest but if they flower and multiply then you are doing your bit for Australian orchids.

Deciduous terrestrial orchids have an annual growth cycle and can be treated like any other bulbs. This is a complete departure from "normal" orchid growing and epiphytic and cymbidium growers will need to rethink their approach. Set aside a separate area for your terrestrials so that you don't fall into the trap of overwatering at the wrong time of the year. Forget about bark and isolite and 'composts' and get your hands into some real soil which can be re-used for years without 'breaking down'. Once you get hooked on terrestrials you will discover all sorts of side benefits, for instance pots of ground orchids don't fall over in the car on the way to a meeting no matter how bad the other drivers are.

A large number of terrestrial species will not grow for long in pots if removed from the bush, so should be left where they are. Removing plants from the bush without permission is illegal in all states. At least 60 species thrive in cultivation so these are the ones to try. The first half dozen species are easy to get from other growers at your local Society but after that it gets more and more difficult to add to your collection. Terrestrials propagate very slowly using normal flasking methods and are therefore not an attractive proposition for commercial growers. My hobby for the last few years has been to try to prove that terrestrials are a commercial proposition because I believe that until good plants can be cheaply produced in quantity they will remain rare and endangered.

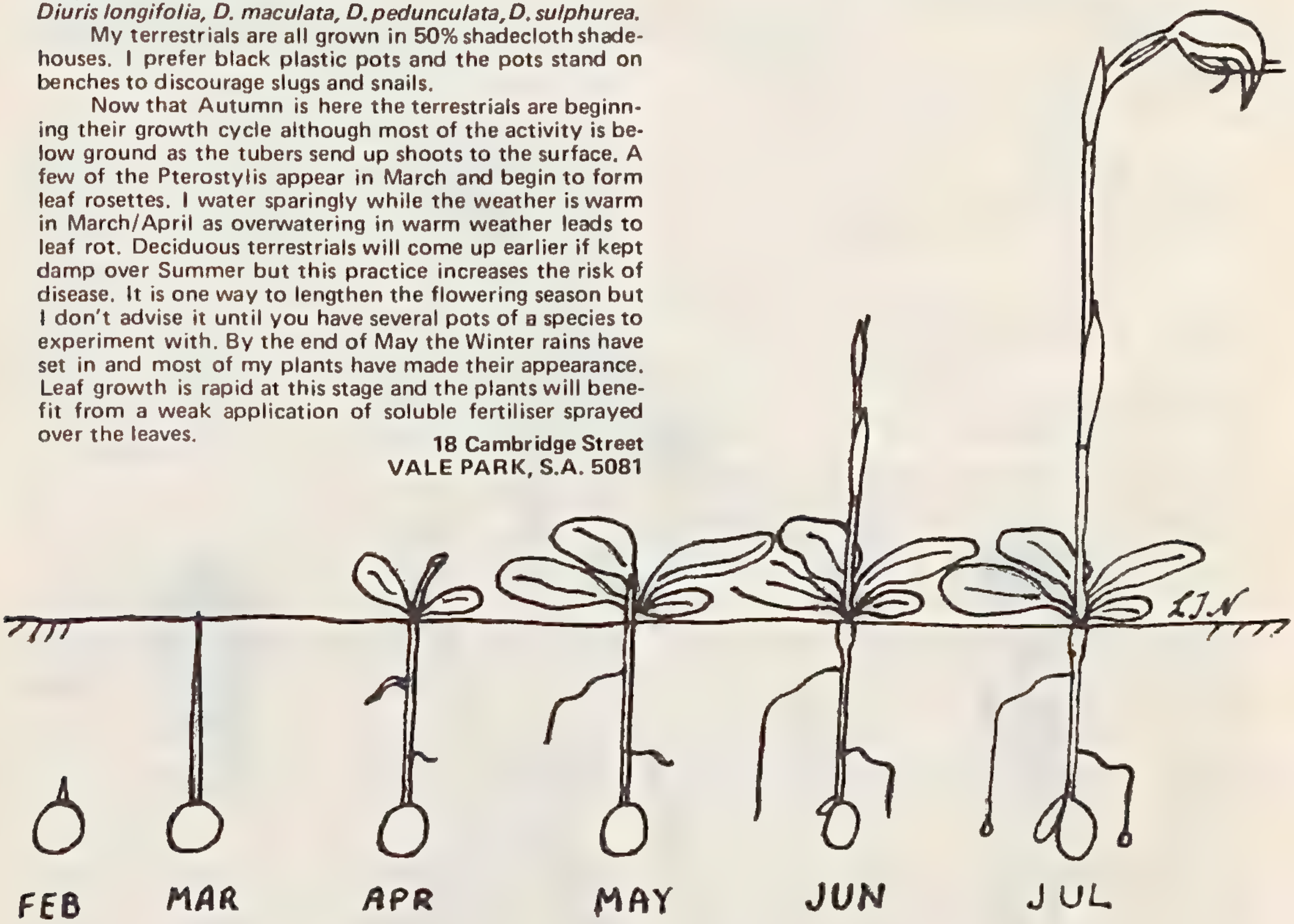
The easiest species culturally are the 'colony' types which multiply annually by 2 or 3 times. Pterostylis, corybas, and acianthus are the ones to start with until you have mastered the terrestrial techniques. Then you can have a go at the 'seedling' types which seldom multiply and must be propagated from seed. This usually involves hand pollination of the flowers and later scattering the ripe seed around the parent plants. It is a hit and miss method but it works often enough. Diuris is the recommended genus in this group although a couple of species, viz. *D. longifolia* and *D. sulphurea* behave like colony types and double their numbers annually. Caladenia and Thelymitra species are more difficult and will quickly die out if conditions do not suit them and their associated fungi.

A few hardy species to try are: —
Pterostylis nutans, P. curta, P. concinna, P. pedunculata
Acianthus exsertus, A. renifomis;
Corybas diemenicus, C. dilatatus;
Diuris longifolia, D. maculata, D. pedunculata, D. sulphurea.

My terrestrials are all grown in 50% shadecloth shadehouses. I prefer black plastic pots and the pots stand on benches to discourage slugs and snails.

Now that Autumn is here the terrestrials are beginning their growth cycle although most of the activity is below ground as the tubers send up shoots to the surface. A few of the Pterostylis appear in March and begin to form leaf rosettes. I water sparingly while the weather is warm in March/April as overwatering in warm weather leads to leaf rot. Deciduous terrestrials will come up earlier if kept damp over Summer but this practice increases the risk of disease. It is one way to lengthen the flowering season but I don't advise it until you have several pots of a species to experiment with. By the end of May the Winter rains have set in and most of my plants have made their appearance. Leaf growth is rapid at this stage and the plants will benefit from a weak application of soluble fertiliser sprayed over the leaves.

18 Cambridge Street
VALE PARK, S.A. 5081


GROWTH CYCLE OF
Pterostylis nutans

◆ ◆ ◆

NOTICE:

PROPOSED NEW CONSTITUTION FOR A.N.O.S.

(For adoption by the Annual General Meeting to be held in September, 1979.)

In accordance with a resolution of the Annual General Meeting of the Australasian Native Orchid Society, held on 2nd September, 1978, A.N.O.S. Council has prepared a draft for a new Constitution.

A printed copy of the draft is distributed to members with this, the March, 1979 issue of the *ORCHADIAN* and *notice of motion is hereby given,* in accordance with Clause 23 (a) of the existing Constitution (as amended in 1965), that the following resolution proposed as a special resolution shall be put to the Annual General Meeting of September, 1979: —

> **"That the draft Constitution as submitted to members with the March, 1979 issue of the Orchadian be adopted as the Society's Constitution and that the Constitution in existence prior to this meeting shall be null and void from this date."**

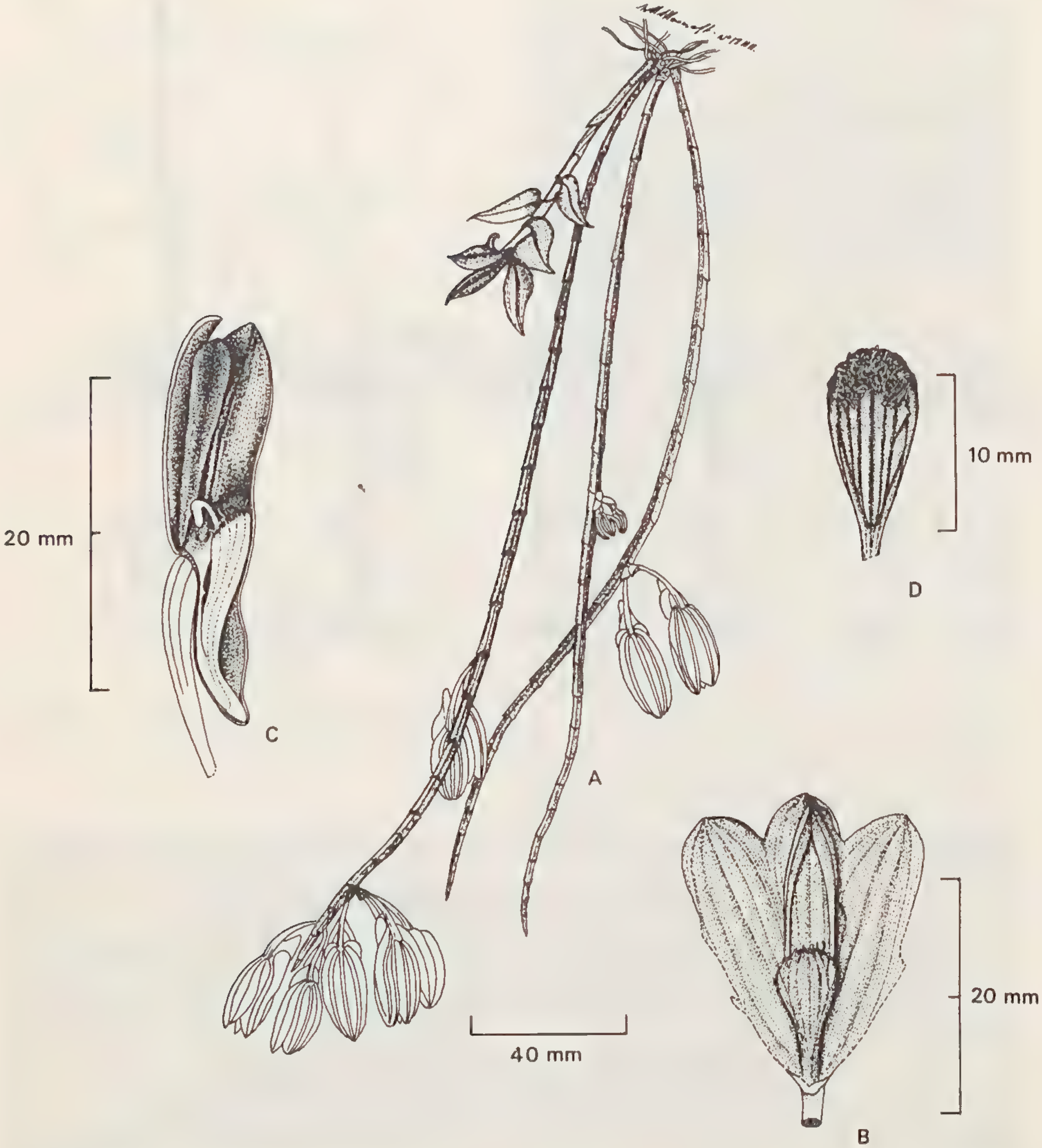
Any proposed motion for amendment of any part of the draft now presented must be in the hands of the Hon. Secretary by 15th May, 1979 for publication in the June issue of the Orchadian, when a notice calling the Annual General Meeting will be published.

K. Edwards
Hon. Secretary

CONTRIBUTIONS TO THE ORCHID FLORA OF THE ARAUCARIA FORESTS IN NEW GUINEA — 1

by N.H.S. Howcroft

In 1974, *Dendrobium codonosepalum* J.J. Smith, was found by the author in the *Araucaria* forest at Pimaga, in the Southern Highlands Province of Papua New Guinea. As this species is not well known, it is here described and illustrated.



Dendrobium codonosepalum J.J.Sm.

Dendrobium codonosepalum J.J. Sm. Nova Guinea 18 (1935) 51 - 52, t. x., fig. 31.
Type. W.M. Docters van Leeuwen 10402, — ix. 1926, Rouffaer River, Jayapura region (Dutch N.G.), L (holotype) *(m.v.)*. — FIG. 1.

Description: Epiphytic herb; roots thin, smooth and numerous. *Stems* pendulous, quadrangular, up to 40cm long, up to 3mm wide (fig. 1A). *Leaves* closely spaced as internodes are about 8mm long; obovate to oblong-ovate, circa 36 x 15mm, light green, sometimes suffused with red; base twisted giving the leafy stems a flat even appearance; margin slightly crenulate; apex acute with a thin point. *Inflorescences* produced at the nodes of the leafless stems, short, 3-4-flowered. *Flowers* tubular, 27mm long from tip of sepals to end of spur, circa 9mm in diameter, red with a violet hue. *Sepals* connate on the basal half, distinctly ridged, 5-nerved (figs. 1A - B); *dorsal sepal* oblong, 20mm long, distally rounded, free portion 5 - 8mm long and 5 - 6mm wide, margin with fine hairs (fig. 1B); *lateral sepals* connate from tip of spur to approximately half of their lower length, narrowly triangular towards spur, 25mm long, distally broad - triangular to obtuse, circa 7 x 7mm (fig. 1B); *mentum* laterally appressed, dorsally appressed to ventral face of ovary for half its length, decurved towards tip (fig. 1C). *Petals* free, more or less spathulate, 18mm long, 2mm at widest point, apex obtuse, slightly fringed (figs. 1B - C); *labellum* more or less parallel to end of column, 11.5mm long, basal portion narrow, fused for about half the length of column foot (fig. 1C), distal portion spathulate, concave, 6.5 x 5mm (figs. 1B, 1D), inner surface more or less smooth, with 5 main nerves and 2 or more lateral nerves (fig. 1D), margin somewhat inflexed, apically with numerous long, curled hairs (figs. 1C - D). *Column* circa 4mm long, 2.5mm high, 3mm wide; *foot* in line with column, circa 7mm long; *clinandrium* with a short curved stelid on dorsal margin and two wings on lateral margin, lateral wings rotund in outline, each wing with several teeth at apex; *anther* more or less quadrangular, laterally rounded, dorsal and ventral edges concave, slightly concave on face, *rostrum* pustular; *pollinia* in two pairs, brown; *stigma* more or less obovate, large;

Distribution: This species is only known from the Jayapura (type), Southern Highlands and Gulf (Wood 1978) regions of New Guinea. It occurs at altitudes of 250 - 900m.

Flowering Season: Several times a year, particularly between the months of July and November. The specimen illustrated was found in bloom in September 1974.

Notes: This species belongs to the section *Calyptrochilus*. Smith (1935) notes that it is closely related to *D. trichostomum* Rchb. f., *D. oreogenum* Schltr and *D. quandriquetrum* J.J. Sm. All of these species have a fringe of hairs on the labellum, however, *D. codonosepalum* differs from the other species by having connate sepals and larger flowers.

LAE 64040 (fig. 1) has slightly smaller flowers than the type (Docters van Leeuwen 10402). It was collected from an *Araucaria cunninghamii* dominated forest, growing on the trunk of one of these trees close to the ground. The *Araucaria* appears to be a favourite host but specimens were also found on other tree species. The *Araucaria* forest at Pimaga occurs at an altutude of 900 metres (lat. 6° 30′s, long. 143° 30′ E). This area has an annual rainfall around 4000mm.

Cultural Notes: Attempts to grow this species in the somewhat seasonal climate at Bulolo (altitude 700 metres, annual rainfall 1615mm), have not been very successful. My observations and those of Smith (1935) and Wood (1938), indicate that this species prefers rather dense shade and fairly moist conditions. Its habit resembles that of *D. lawesii* F. Muell. which occurs under similar conditions. It is possible that cultural treatments for *D. lawesii* might be suitable for *D. codonosepalum*.

Acknowledgements:

I wish to thank Mr Barry Conn, Bulolo Forestry College for his advice and assistance in correcting and arranging the manuscript, and Mr M. Galore of Botany Division, Lae, for the reproduction of my illustration.

Note: The above mentioned illustration No. 17 NH has been lodged with the Lae Herbarium under number 1547 for reference purposes and cannot be reproduced without permission of the author.

Literature cited:

Smith J.J. 1935. *Nova Guinea* 18 : 51. t. x, fig. 31
Wood J.J. 1978. *Orchid Review,* Vol. 86, No. 1020 : 180 - 183, figs. 132 and 134.

FOREST RESEARCH STATION
P.O. Box 134, Bulolo, Papua New Guinea

(Editor's note: The reference above to J.J. Wood's article in *Orchid Review* gives an excellent colour photograph by Neville Howcroft (fig. 134) of an inflorescence on one of Mr Howcroft's plants of *D. codonosepalum* growing at Bulolo. Fig. 132 reproduces J.J. Smith's drawings.)

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THE AUSTRALIAN ORCHID FOUNDATION

by Gerald McCraith

The Australian Orchid Foundation was formed to benefit the orchid species, and growers who are interested in their cultivation.

The Objects of the Foundation are very broad, and one of them is: — 'to support and finance research into the growth, preservation, propagation and cultivation of orchids'.

The Foundation is a comparatively new organisation with limited resources, but extends an open invitation for applications for support or grants by any person or group who have a desire to do specialized work on any subject that relates to the orchid species, whether they are endemic or otherwise.

The invitation is also extended to persons who would like to see 'specific work' carried out that will be of benefit to the cultivation of orchids. It is important that specific work be referred to, rather than that of a general nature. The Directors of the Foundation invite anyone to set out in specific terms the nature of the research work that they would like to see carried out which will be of benefit to the growth and health of orchids.

The Foundation will study the question and, if thought practical, will make efforts to provide an answer on a scientific basis. Problems which interest growers are one of many reasons for the formation and existence of the Australian Orchid Foundation.

All proposals and requests should be addressed to:
107 Roberts Street, ESSENDON, Victoria 3040

Dendrobium sophronites Schltr

We have had some very favourable comments on Tom Reeve's article in the December, 1978 issue and we look forward to more of Mr Reeve's work later this year. Meanwhile he has drawn our attention to two minor errors in the printing. Readers may wish to amend their copies as follows:

Corrigenda (Orchadian Vol. 6, No. 2)

- Page 36: Under "Section Oxyglossum", line 10 should read "adnate with the lip" (not "tip").
- Page 38: Under "Distribution", line 3 should read "species of the mid-montane zone" (not "or").

SOME THOUGHTS ON *Dendrobium X gracillimum* (Rupp) Rupp

by Ted Gregory

Surely one of the most beautiful sights of our local orchid world must be to come upon a clone of *Dendrobium X gracillimum* in full flower in its natural setting, with all those creamy clustered spikes of glory on show for anyone who may be lucky enough to behold it. I guess I have been one of the lucky ones as I have seen scrubs in this part of the world where one might see twenty or thirty of these fantastic orchids in a single day's hike.

As is common knowledge these days, *Dendrobium X gracillimum* is a neutral hybrid of *D. speciosum* and *D. gracilicaule* and when one looks at a plant, this is exactly what one sees; as almost all gracillimums are more or less half-way between their parents, looking like *gracilicaule,* yet with the size of *Dendrobium speciosum var. hillii* which is normally one of these parents. In my experience *D. speciosum var. hillii* is always one parent, which accounts for the great length of cane which is one of the features of *D. X gracillimum* in this area, where canes of over one metre are quite common. I have seen many man-made gracillimums that have been bred from straight *Dendrobium speciosum* (i.e. *var. speciosum*) the more southern and more stocky form of "rocklily", so called, and these are a completely different plant to look at, being of a much more compact appearance as you would expect from their more compact parent.

The variety and colour of flower forms of *Dendrobium X gracillimum* are as infinite as our other common hybrid, *D. X delicatum,* and that means that you will hardly ever see two clones with identical flowers: some will stay cupped as *Dendrobium gracilicaule* normally does, yet others will open wide and flat and display themselves well. The normal colour is a smooth, yellowy cream, but the range extends from almost pure white to a rich yellow that is almost orange. There are also beautifully speckled forms that are just like giant gracilicaules. I have three speckled clones, but I have never been able to set seed on any of them, worse luck; whereas I have no trouble setting seed on my pure coloured clones. The flowers normally run from half an inch to three-quarters of an inch in diameter, but I have one that flowers much the size and shape of a normal *D. speciosum var. hillii.*

Raceme length and strength has a large range too, some clones having very strong racemes that display themselves very well, whilst others can be quite pendulous. Flowers-per-raceme varies on much the same scale; some clones will average thirty, yet others will average eighty or more. Another habit of this orchid is the fact that it will flower for years off the old canes wherever there is an "eye" on these canes. This is one of the reasons why a well tended clone will be a complete mass of flowers at times; so be careful not to cut off old canes until they are completely spent.

D. X gracillimum is very rare in some areas and comparatively common in others, and as with all natural hybrids, both parents must be fairly common for it to occur at all. Nature is fairly prodigal and the survival rate of orchid seedlings in the wild is surely at long odds. *D. X gracillimum* sets seed fairly easily and must surely have "selfed" and multiplied in some areas for the plant to be as common as it is in some isolated areas. *D. X gracillimum* is not very choosy about its habitat, but shows a preference for myrtle ridges at altitudes between five hundred and fifteen hundred feet. The myrtle seems to be a favourite host tree, with the stinging tree a close second. It is a typical hybrid in the fact that it is a very robust grower, as plants of over two hundred canes have been found in this region. I would love to know how old a plant of this size would be as a matter of interest. Anyone who has been associated with the myrtle scrubs for any length of time cannot have failed to notice the huge mortality rate amongst orchids from heavy winds that occur periodically over these areas. This is not from whole trees being uprooted, although this happens often enough, but from small branches being snapped out of the crowns of these myrtles that seem to be very brittle in their younger wood. *Sarcochilus falcatus, D. beckleri, D. gracilicaule* and *D. X gracillimum* seem to suffer worst in this regard, as I have seen scrub floors just littered with plants of the above, and anyone who can get to these areas before the wallabies remove the evidence will have seen what I mean. I have come across many young plants of *D. X gracillimum* in this way, most of them with canes no more than six inches long and quite often passed over as just *D. gracilicaule* by untrained eyes. The amount of small plants of these that I have seen on the ground is my main reason for saying that *D. X gracillimum* "selfs" quite easily in the wild. One such plant I picked up comprised four canes; the longest about seven inches; the next cane was ten inches and the next, which was thirteen inches long, produced a raceme with fifty flowers. Talk about hybrid vigour!

D. X gracillimum is as easy to grow in the bushhouse as most of our coolgrowing dendrobiums, but it shares one weakness with *D. falcorostrum* and that is its habit of getting "dampoff" in the new growths if it happens to get wet-footed in the pot. To minimise this danger it is imperative that the plant be placed in a pot containing a very open mixture and to be sure that the rhizome is on top of the mixture and not buried in it. I guess any type of pot will do, but I prefer terracotta, and the shallower the pot, the better.

What is regarded as the standard native mix in this part of the world is ideal for *D. X gracillimum:* that is, one-third charcoal, one-third oak bark (Red Mountain Oak) and one-third sandstone, in pieces obtained as follows: these ingredients are massaged with some heavy instrument and then passed through a one-inch screen. These screenings are then passed over a quarter-inch screen and anything that passes through this screen is discarded or used for small plants or in cymbidium mix. The remaining chunks which should mostly be between one-quarter and three-quarters of an inch in size make a mix that will last till your plant grows out of its pot.

This is used straight in shallow pots, but if deep pots are being used I fill the bottom third of the pot with sandstone chunks of any size as long as they will go in the pot. If you are potting a plant out of the bush, before you pot it, trim off most of the old roots and any damaged growths and then dunk it in a bucket or tub of water that should contain a fungicide, a growth inducer such as Field Pack (R) or Formula 20 (R), and an insecticide of some sort. Old roots and damaged growth will only hamper your plant as it tries to adapt to your bush house and the above treatment will give it a great start and also help keep out pests that plague orchid plants in the wild.

As *D. X gracillimum* is such a tall plant and must be high in the pot, a stake or two will most likely be necessary. Also a piece or two of pantyhose over the plant and right around the pot will help hold the plant until it sends out new roots to support itself. If the plant is left loose in the pot it will wobble and keep breaking the tips off the new roots as they try to take hold and your plant will take ages longer to establish itself.

If you prefer to hang your orchids, *D. X gracillimum* will grow equally well if it is mounted on a piece of ti-tree or tree fern and suspended in your orchid house. In my experience the only advantage in hanging is the fact that this method goes a long way to solving the slug and snail problem which is one of the major problems to overcome in successfully growing any orchid.

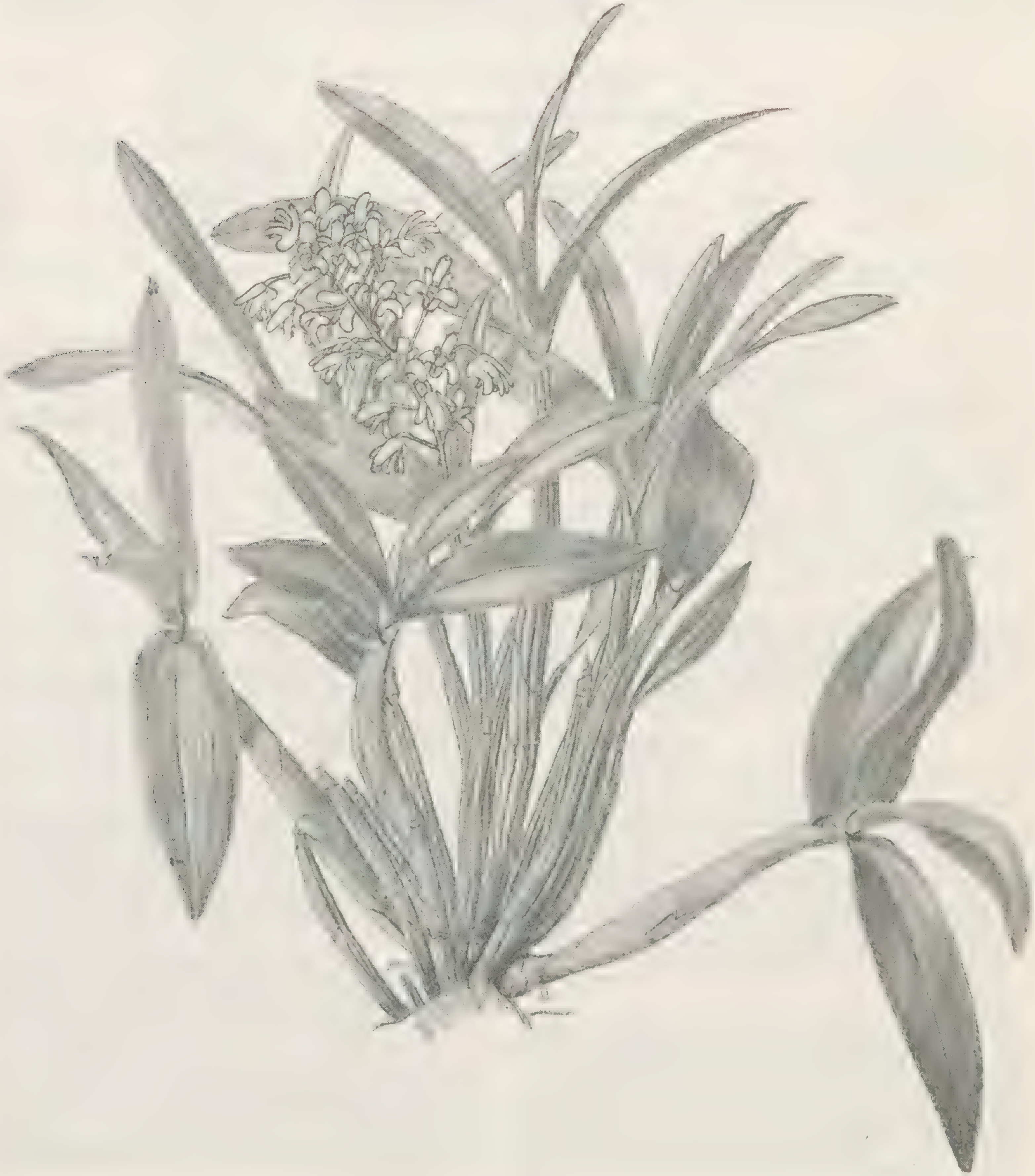
Feeding and fungiciding is as for all of our cool growing dendrobiums; that is, fungicide regularly year-round and feed a balanced fertilizer from the finish of flowering until all new growths have hardened off in the autumn. Do not be disappointed if you do not get flowers on the new canes as *D. X gracillimum* is one of only a few of our orchids that do not normally flower off canes that are under twelve months old. This orchid will quite often produce two crops of canes in one season if you can get the first set on their way fairly early in the season.

One final observation: I have seen many man-made gracillimums and have yet to see any that are equal to or better than the natural clones. To my knowledge the "man-mades" have all had *D. speciosum* as one parent and the "naturals" have had *D. speciosum var. hillii.* I would like to see the cross made again using var. *hillii,* just to see what would happen.

I have seedlings of *D. X gracillimum* "selfings" going well but have not as yet made the hybrid cross. Perhaps some of our readers may have done so and can pass on their findings. In this way we can help one another in our pursuit of a common interest.

— Ted Gregory
RMB 201, Taree N.S.W. 2430

(Our illustration is obviously of a man-made hybrid. — Ed.)



Drawing: Keith Betts

Dendrobium X gracillimum (Rupp) Rupp

SOME NOTES ON CLIMATE, HABITATS AND CULTURE FOR AUSTRALIAN DENDROBIUMS

Recently, the Secretary of ANOS, Mr Keith Edwards, received a very interesting letter from a member living in Ekeren, Belgium (Mrs DianeBruyninckx-deLanghe), who grows Australian and New Guinea orchid species.

While she admires greatly the cultural notes written each quarter by Ted Gregory, she is disappointed by the lack of information as to climatic conditions in the various habitats of species described in our articles.

In this particular letter she asked for help in her attempts to start tubers of *Diuris punctata* into growth. Advice was sent by Keith Edwards immediately and later we wrote, passing on Les Nesbitt's prescription. Judging from some colour slides of her *Pterostylis baptistii*, I would say Diane has little to learn about that species.

However, I feel that the present issue of the *Orchadian* should make amends, to some extent, for our past omissions. In addition to Les Nesbitt's first article of a series on growing deciduous terrestrial native orchids (in this issue), we have obtained from Ted Gregory some climatic data on his part of the world (the central north coast of New South Wales). This can be used by overseas growers as a reference in reading his past and future culture notes on the cool growing epiphytes:

CLIMATE OF THE TAREE AREA, N.S.W.

LATITUDE: 31 deg 54 min South

LONGITUDE: 152 deg 29 min East

ELEVATION: 6.1 m

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Rainfall (mm) mean:	127	141	139	117	88	99	79	68	64	75	77	104
Annual mean rainfall = 1178 mm												
Min. Temp. (daily) mean:	17	17.8	15.3	11.8	8.4	6.9	4.5	5.5	7.5	11.6	13.4	15.8
Mean Annual minimum Temp. = 11.3 deg C												
Max. Temp. (daily) mean:	28.6	28.6	27.6	25.4	21.5	19.2	18.8	20	22.7	24.9	26.4	27.9
Mean Annual Maximum Temp. = 24.3 deg C												
Mean Relative Humidity (%) for 9 am:	65	71	73	76	73	78	69	67	63	65	62	59
Mean Annual Relative Humidity = 68 %												
Mean Relative Humidity (%) for 3 pm:	61	61	58	55	54	57	47	45	45	58	54	57
Mean Annual Relative Humidity = 54 %												

For good measure we shall include, by permission of the Editor of the "Journal of the Native Orchid Society of South Australia", an article by Jim Simmons in the February, 1979 issue.
Although this article was written for growers in Adelaide, which is far away from the natural habitat of any of our dendrobiums, its objective is to show how the necessary conditions can be simulated. And that advice holds good for growers everywhere.

Growing Native Australian Dendrobiums

by Jim Simmons

The Genus

Currently, there are over 50 species or putative hybrids of indigenous Dendrobiums which occur in Australia. Many of these are endemic. Most of the species from the Phalaenanthe and Ceratobium sections have been used extensively overseas for hybridising for many years but the last two decades have seen a tremendous growth in the selective crossing of many of the cooler growing species so that an extensive range of man-made cool growing hybrids is now available to growers.

Natural Habitat

Their natural occurrences range from the tropical areas of the north-west of Western Australia, the northern areas of Northern Territory and Queensland ranging through subtropical and temperate zones of the east coast region as far south as Tasmania where one species, *D. striolatum,* occurs. These areas, although they cover a wide range of temperatures – both maximum and minimum – have one thing in common: they all enjoy a predominantly summer rainfall and its attendant high humidity and a relatively dry winter. Adelaide and South Australia in contrast has a hot, dry summer with winter rainfall.

Cultural Requirements

Temperatures: The table below divides the species into cool, medium and warm growers and although geographic location is a consideration, it should be remembered that elevation is also an important factor. For example *D. agrostophyllum* is usually found in north Queensland at elevations of about 1000 metres and can be regarded as a "cool grower".

Broadly we may consider the following conditions:

(a) Cool Growers – where winter temperatures do not drop below 3°C or 4°C. These do well in a shade or bush house in Adelaide with some weather protection from both wind and excessive rain in winter.

(b) Medium Growers – where winter temperatures do not drop below about 12°C. Medium growers will require a greenhouse with some heat for satisfactory growth.

(c) Warm Growers – where winter temperatures do not drop below 17°C. Warm growers require a heated glasshouse.

AUSTRALIAN DENDROBIUMS TEMPERATURE GRADING

COOL

D. linguiforme
D. cucumerimum
D. teretifolium
D. striolatum
D. tenuissimum
D. mortii
D. beckleri
D. racemosum
D. x grimesii
D. pugioniforme
D. monophyllum
D. schneiderae
D. speciosum
D. ruppianum
D. aemulum
D. gracilicaule
D. x suffusum
D. x gracillimum
D. falcorostrum
D. fleckeri
D. adae
D. kingianum
D. x delicatum
D. agrostophyllym

MEDIUM

D. x foederatum
D. rigidum
D. tetragnum
D. lichenastrum
D. toressae
D. mortii
D. carrii
D. bairdianum

WARM

D. wassellii
D. bifalce
D. bigibbum
D. dicuphum
D. x superbiens
D. x vinicolor
D. bigibbum var. venosum
D. canaliculatum
D. antennatum
D. nindii
D. discolor
D. johannis
D. wilkianum
D. stuartii
D. smillieae
D. ophioglossum
D. baileyi
D. cancroides
D. luteocilium
D. tozerensis
D. malbrownii
D. lobbii

Light Conditions: Dendrobiums generally require high light intensities: 20,000 lux to full sunlight. For cooler growing types 40% shade or less is adequate during spring and summer months when the new growths are forming. Light intensities can be increased in the autumn and winter months to as high as practical — short of scorching.

Potting Methods: Due to their epiphytic habit most Dendrobiums can be grown on slabs of tree fern, bark, cork, etc. If using tree fern – boil it before use as some species can have very low P.H. values and are far too acid for the plant. The big disadvantage with slab culture is where low summer humidity is experienced and unless this is adequately compensated for, the results can be disappointing. Alternatively, Dendrobiums respond well to pot culture. Because they like to dry out between watering, they will do better in clay pots than plastic. Slotted clay pots are better still as they permit adequate aeration of the root system. Small seedlings ex community pots, or keikis, can be started off in 2" "thumb pots" and progressed as they mature. They prefer to be crowded and under-potted rather than over-potted. Two years should be a maximum period for repotting due to the build-up of salts from water supply and fertilisers.

Potting Mixes: Seedlings respond well in a mix of 1/4" to 1/8" charcoal with about 10% shredded peat moss added. Some growers prefer fir bark chips of a similar size or a mix of both.
It is prudent to sterilize the mix on a tray in the oven before using (an hour at 300°F is adequate) and wash the seedlings in a weak solution of "Benlate" or other fungicide, before planting out.
As plants are "potted on" and a firm root structure is established they can be grown in a larger size, say 1/2", charcoal, fir bark or scoria. A mixture which has been found to be quite satisfactory is about 75% scoria and 25% charcoal.

Watering: When new growths are forming in the summer months, and provided an open mix is used, it is almost impossible to over-water. Overhead watering should be avoided if possible as water left in the centre of young developing growths can cause bacterial rot. Winter watering can be reduced to once a week or less. Just sufficient to stop shrivelling of the pseudo-bulbs.
Some consideration must be given to increasing the humidity in summer be it shadehouse or glasshouse culture This may vary from a wet gravel or scoria floor in the house to a misting system, humidifier or evaporative cooler. This is a most important factor and can mean the difference between keeping plants alive or making them grow.

Feeding: During their growth period Dendrobiums will respond to a weekly feeding of "Nitrosol" or any 30-10-10 fertilizer will be found suitable. Nitrogen should be reduced when the new growths have formed and a suitable winter mix is a 10-10-10 fertilizer.

Ventilation: Like most orchids, Australian Dendrobiums prefer good air movement and ventilation around the plants. In glasshouses it will require a fan or cooler, giving about 25-30 air changes per hour to hold the house temperatures constant during summer months due to the high thermal load on the glass.

Pests and Diseases

Mealy bugs, thrips, brown scale and red spider can all be problems. Rather than spraying, the granular systematic insecticide "Disyston 5" has been found effective in controlling most pests, except Red Spider. Infestation of mealy bugs should be removed with a fine artist's brush dipped in methylated spirit at the time of treatment with "Disyston". It is usually necessary to use "Kelthane" spray or similar for Red Spider and repeat the treatment at 10 day intervals for about three applications. Slugs and snails may be controlled by the normal application of "Baysol". Ants, which are more indirect than direct pests, may be disillusioned by a sprinkling of "Chlordane" around the benches.

Common Problems

A common complaint from Dendrobium growers is lack of flowers and/or the excessive formation of "keikis" on the healthy plants. Dealing with the latter first -- some species of Dendrobiums are very prone to form "keikis" at the expense of flowering. This is marked in *D. kingianum* and its extensive hybrids, *D. bigibbum, D. discolor,* etc.

However, the formation of "keikis" and/or the lack of flowering on otherwise healthy plants is usually due to one or a combination of the following causes:

(a) insufficient light,
(b) autumn/winter feeding of high nitrogen fertilizer,
(c) night temperatures too high in winter. For example, cool growers should experience at least one month of minimum temperatures of less than 10°C in the autumn/winter period to ensure the establishment of flower buds.

J.T. Simmons
4 Gothic Avenue, Stonyfell, South Australia 5066

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NEW AUSTRALIAN NATIVE HYBRID

In December 1978, the *Orchid Review's* list of new orchid hybrids included one new Australian hybrid, registered by B. Poulton (R.H.S. October 1978 Registrations) as follows:
Name: **Dendrobium Esme Poulton**
Parentage: *D. bigibbum x D. kingianum*
This crossing must be of considerable interest to hybridists and growers alike. In the first place it is another cross between the warm growing Phalaenanthe Section and the cold growing Dendrocoryne Section, hopefully to produce a cool grower. Secondly, *D. bigibbum* is possibly the only native species of the dendrobium genus having really wide and round petals. Many beautiful hybrids have been made from *D. kingianum* but none having the sought after roundness of petals. What a pity we cannot show readers a photograph of this plant and its flowers! Unfortunately B. Poulton's address is not known to us. If it were, we should try to get more information for our hybrid enthusiasts. If any reader can help, please let us know.

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A New Combination in *Liparis*

Telopea., Vol. 1 (5) 1978, published by the N.S.W. Department of Agriculture for the National Herbarium of N.S.W. contains an item on p. 357 which will be of interest to those, like myself, who possess a specimen of *Liparis cuneilabris* F. Muell. ex Benth.

D.F. Blaxell has established the new combination *Liparis angustilabris* (F. Muell.) D. Blaxell for the North Queensland orchid, formerly known as *L. cuneilabris* F. Muell. ex Benth. nom. illegit.

We shall not go into the technical reasons for this change, but merely alter our plant label.

A limited number of copies of Rupp's *Orchids of N.S.W.* is available from the Secretary ANOS at $4 per copy including postage within Australia.

ANOS Warringah Group

The annual general meeting of the Warringah Group of ANOS elected the following office-bearers for 1979:
President: E.G. Gordon
Vice-President: R. Lowe
Secretary: D. Phillips
Treasurer: Mrs J. Cook

ANOS Newcastle Group

The annual general meeting of the Newcastle Group of ANOS elected the following office-bearers for 1979:
President: W.V. Moloney
Secretary: Mrs Susan Herd
Treasurer: Richard Hall
Editor: Mrs Judy Parker

Blue Mountains & District O.S.

Officers elected for 1979 are:
President: Keith Edwards
Secretary: M. Wilde

On Other Orchid Journals

Of the many orchid journals that come to an editor's desk – from the club "newsletters" and "bulletins" with their local esoteric chit-chat to the heavy botanical scientific journals – only a few stand out as being quite indispensable. This is not a comprehensive review but merely an impulsive reaction to what has appeared during the past year. Comparisons are odious, so I merely select two highlights for the benefit of readers who may not have read them.

First, there is the monthly Journal of the Native Orchid Society of South Australia. This Society has been in existence only about two years but right from its beginning the Journal has been impressive. Dispensing with social chit-chat it deals with all the necessary meeting notices, other matters of local significance and then gets down to serious and useful articles of interest to orchid growers everywhere. Of course NOSSA has had a remarkably successful beginning so far as membership is concerned. (We have written about this before.) This probably accounts for the high standard of the writing – there being plenty of members to ensure a good selection for the editor to work on. The one objection I have to offer is that there is no mention of the editor at all. He has, so to speak, "done one greater thing than all the Worthies did – which was to keep that hid". I suspect it is he (as well as his writers) who gives the journal its general air of competence, its unusual accuracy in nomenclature of the orchids and its continuing interest for its readers. To those members of ANOS who join local groups in other States in order to get more reading material on our native orchids I say: Don't overlook this one!

Turning to overseas journals – and again without going into detail – the *Orchid Review* comes to mind as the one with greatest concern for Australian native orchids. Every now and then we get a feature on orchids from "Down Under" (an overdone expression perhaps?). Strange as it may seem, I generally get my first news of new Australian native hybrids from the *Orchid Review.* For those interested in taxonomy there is a series by P.J. Cribb (of Kew) called "Recent Taxonomic Literature on Orchids". Quoting from No. 6 in this series, I select a few examples (O.R. July, 1978):

(1) A resume of D.L. Jones's "Miscellaneous Notes on Australian Orchidaceae: 2. Reduction of 6 teratological forms to synonymy". This is, of course, quoted from the *Orchadian* (1977) so you don't need that; but it is nice to be quoted.

(2) Lavarack, P.S. Orchids of the Iron Range area. AOF. Brisbane 36 pp. (1977) – a brief abstract outlines the findings.

(3) Senghas, K. *Cirrhopetalum masonii* – a new species from Papua New Guinea is quoted from *Die Orchidee.*

(4) Wood, M.W. on *Paphiopedilum praestans* in Curtis's Botanical Magazine is quoted. In this case, for the sake of our many species collectors I quote Cribb's reference: "The beautiful New Guinea orchid *Paphiopedilum praestans* is the latest orchid to be illustrated in colour in the Botanical Magazine. An account of its history in cultivation and method of cultivation are also provided." The author points out that the plant in cultivation under the name *'P. bodegomii'* is to be included in this species.

Finally, I look forward to seeing an abstract, in due course, quoting S.C. Clemesha's review of *Dendrobium bigibbum* Lindl. in the *Orchadian* Vol. 6 (2), December, 1978.

– Editor

ORCHID CONSERVATION – A Matter of Conscience

by P.S. Lavarack

(Reprinted from THE NATIVE ORCHID BULLETIN (Qld.) of November, 1977, with permission of the author.)

In 1959 the Queensland Government passed an Act proclaiming that "The Cooktown Orchid shall be the Floral Emblem of Queensland". This choice was well received as it was a beautiful plant, colourful, distinctive, but with a simplicity of line which made it well suited to stylisation on semi-official documents. It was also relatively easily cultivated in coastal areas of the State.

But what has all this meant to the Cooktown orchid? Despite the fact that the habitat of this plant remains virtually untouched, its numbers have now been reduced very significantly in many areas. It is now no longer to be found near Cooktown and, in other places like Princess Charlotte Bay where it was once abundant, it is now becoming scarce. It is not uncommon to see plants offered for sale in newspapers – sometimes in lots of 100. Plants are often sold in chain stores to people who have no idea of how to grow them. It would be safe to say that at this stage the only reason the Cooktown orchid is still abundant in its natural state is the remote and dangerous nature of much of the country in which it grows. While there are no figures on the subject it would also be a safe guess that less than 10% of the collected plants survive 5 years in cultivation.

There is almost never any justifiable excuse for the collection of this species, as its particular habitat along watercourses and on rocky hillsides is rarely cleared. Virtually all of the plants are collected illegally and sold illegally. All this would be understandable – although certainly not forgivable – if this plant were difficult to raise from seed. No orchid of course is easily raised from seed by amateurs, but relatively speaking, the Cooktown orchid is a good subject for this means of propagation. With the large quantities now in cultivation there should be no need for any further collections to be made.

The problem exemplified above by the Cooktown orchid (*Dendrobium bigibbum* Ldl.) is not limited to Australia. In fact Australia has rather less problems in this sphere than many other nations. Recently an international orchid journal published an account of the rediscovery of a plant considered probably extinct. This was accompanied in the same issue with an advertisement, offering plants of this species for sale at a relatively high price.

Not all the 20,000 species of orchids in the world are threatened by problems of this nature. The far greater danger lies in habitat destruction. Within Queensland vast areas of prime orchid habitat have been destroyed over the past hundred years mainly by the beef, dairy cattle and sugar industries. The trend is still continuing although the agencies have changed to softwood plantations and real estate. Vast areas of important sandy coastal wallum country with its rich orchid flora have been, and are being, bulldozed between Maryborough and the border for housing developments and, to a lesser extent, for mineral sand mining, while a significant proportion of the State's remaining rainforests are being converted to pine plantations.

This process is inevitable and conservation bodies can do little more than fight a holding action in certain important areas. The major hope for orchids and other threatened plants lies in National Parks and other reserves. These need to be large to avoid edge effects and need to be well policed. They should also be regarded as inviolate by orchid collectors, not because of the heavy penalties for those who are caught, but as a matter of conscience.

It is often said that the cultivation of orchids should be encouraged to ensure the preservation of the species. Well, let us have a look at this proposition.

Firstly, only a small proportion of the species are considered interesting enough horticulturally to find their way into collections. This applies to even the most enthusiastic "species collectors". There are so many to choose from that those with small drab flowers are rarely grown – particularly if some extra effort is required to grow them. Secondly, a rare plant is often safely in cultivation for as long as its owner lives and retains an interest in it. Thirdly, only the "good forms" are grown. Whatever characteristics the horticultural "also-rans" may possess are quickly lost. The resulting heavily selected populations in cultivation may be unsuited to re-introduction to the native habitat.

Thus in cultivation what is preserved is not the species with all its attendant, indeed vital, variation but, in many ways, a stereotyped evolutionary dead-end. This suits the needs of horticulture well, but the best that can be said of this in terms of conservation is that it is slightly better than nothing.

In effect there are two ways of looking at an orchid plant. One is to see it as a show-bench plant, beautiful, a satisfying achievement, self-contained. The other viewpoint is as but one part of a greater whole. Would you prefer a photograph of the Ravine Orchid *(Sarcochilus fitzgeraldii)* set against a background of black velvet or against a sparkling waterfall? Both are valid viewpoints, but only one has a real meaning in terms of conservation. *If a species is preserved only in cultivation, then in a sense the battle has been lost.*

The plants preserved in reserves should be considered sacrosanct. The seeds of these plants may, in certain conditions, be another matter. Orchids, as a rule, produce far more seeds than are needed to ensure the success of the species. With modern techniques which ensure good germination and survival rates, it may be possible in some cases to collect a small proportion of the seed produced for use in horticulture. This underlines an important principle of preservation by cultivation. *A plant should not be considered to be "in cultivation" until it can be successfully propagated from seed.* Because seed raising is a complex and, relatively speaking, expensive business, very little attention is likely to be paid to plants which are not considered a commercial proposition. Most Australian orchids are in this category.

It was mentioned earlier that conservation is largely a matter of conscience. Obviously it cannot be wholly so and strong laws are needed to aid those with a poorly developed conscience. In Queensland the existing laws are outdated, but strong laws are currently being drafted which will have the effect of stopping the sale of illegally-obtained plants. Hopefully, at the same time, the cultivation and propagation of legally-obtained plants will be encouraged.

There has been over the last century an increasing international trade in orchids. This has, in some instances, done irreparable damage to wild populations of certain species and indeed a few are believed extinct. An attempt to control this trade has resulted in an international agreement, termed the "Convention on International Trade in Endangered Species". On 27th October, 1976 Australia's ratification of this Convention came into effect. The Customs (Endangered Species) Regulations made under the Customs Act of Federal Parliament give effect to the provisions of the Convention.

The family Orchidaceae are listed in Appendix II of the Convention. The rules governing import and export or organisms listed in Appendix II include the following: –

" 2. The export of any specimen of a species included in Appendix II shall require the prior grant and presentation of an export permit. An export permit shall only be granted when the following conditions have been met –

(a) a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species;

(b) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora;

4. The import of any specimen of a species included in Appendix II shall require the prior presentation of an export permit."

A few orchids are listed on Appendix I. These are: — *Cattleya jongheana, Cattleya skinneri, Cattleya trianaei, Didiciea cunninghamii, Laelia lobata, Lycaste virginalis var. alba, Peristeria elata.*

The same provisions apply to these with the additional provisos that before import is allowed both an export and an import permit are required. So far no Australian orchid is listed on Appendix I, but species such as the Cooktown orchid *(Dendrobium bigibbum)* and *Phaius tancarvilliae* may soon warrant consideration. In Australia the "Scientific Authority" is the Australian National Parks and Wildlife Service while the "Management Authority" is the Customs Department.

If these laws seem harsh and restrictive orchid collectors have only themselves and their predecessors to blame. For too long collectors have replaced dead plants with jungle-collected imported plants time and time again, instead of admitting deafeat. They have preferred a large flowering-size collected plant to a nursery-raised seedling. These attitudes will have to change in the not too far distant future when the supply runs out, so how much better it is that they change now while some of the species have a chance.

— National Parks & Wildlife Service
Fairfield Road, Yeerongpilly, QLD. 4105

A CHECKLIST OF AUSTRALIAN NATIVE ORCHID HYBRIDS

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NEW ANOS JUDGES

Lloyd Bradford, a Vice-President of ANOS Council, has taken up the important new position of Registrar of Judges for ANOS. As the former Chairman of the Committee set up in 1977-8 to examine the feasibility of conducting a special course of training for judges specialising in Australian native orchid species and hybrids, Lloyd reported, in our December issue (p. 34), on the successful completion of the first course. He listed the names of the seven successful candidates at the qualifying examinations. These have all been appointed by Council as certificated judges for the purpose of judging at monthly meetings.

At its March meeting, Council approved the Registrar's recommendation that two of the certificated judges should be appointed Associate Judges to work with the existing official Judges as and when required for assignments at annual shows and other functions conducted by ANOS Groups and affiliated societies. The new Associate Judges are **Mike Harrison** and **Norman Stockton**, both of Sydney.

We look forward to further developments from the ANOS Panel of Judges by way of new courses of training and perhaps even new standards for appraising our natives. We do not mean, necessarily, that the standards adopted by the Australian Orchid Council are deficient, but rather that the way in which they are applied and interpreted may influence future breeding programmes. What should we be looking for on the show bench of the future? Your ideas would be welcome.

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From *Native Orchid News,* Journal of the Darling Downs Group of ANOS, February, 1979, we give you the following, written by Editor H. Biddle: —

THE BOOKLET

I have just rediscovered my copy in small booklet form of "A Checklist of Australian Native Orchid Hybrids". I can appreciate the long, grinding hours that went into compiling this document and from the point of view of an absolute layman, I can only say that it has proven invaluable in at last allowing me to know (with a minimum of effort) just how my hybrids came about, who did them and the "common" name, just to name a few of the advantages. My thanks go out to those who so painstakingly compiled this booklet for our use in hybridizing.

SARCOCHILUS MOOREI (Reichb. f.) Schltr

by P.S. Lavarack

(Reprinted from THE NATIVE ORCHID BULLETIN (Qld.) of October, 1976 with permission of the author.)

Apart from the very recently described *Sarcochilus brevirachis, S. moorei* is probably the least known of the Australian members of the genus. On several field trips to Cape York over the past five years, *S. moorei* has become almost an old friend but it was not until the 1976 visit to Iron Range that I saw it in flower.

Within Australia *S. moorei* is apparently limited to the McIlwraith and Iron Ranges and adjacent coastal areas. It was not encountered in the quite extensive lowland rainforests near the headwaters of the Jardine River, although it may be in the Bamaga forests.

It is basically a plant of the tall, shady moist lowland forests, where it often grows low down in dense shade. Occasional plants are found in exposed positions such as on granite boulders and these seem to grow equally well in this position.

However, there is little doubt that it is the moist gallery forests of streams such as the Claudie, which are its true home. In fact, in these positions it is a very common orchid and also one which attains a large size. Plants of more than one growth and with leaves up to 30cm (12") long are quite common and are easily mistaken for *Phalaenopsis* which also occurs in the area. Such a plant may have half a dozen or more flower spikes, each spike up to 45cm (18").

The flowers certainly bear no resemblance to a *Phalaenopsis,* but are in some ways similar to *Rhinerrhiza divitiflora* in that they are very short lived, are borne on long inflorescences and are of a similar yellow spotted with brown colour. In both species the buds on the raceme remain dormant for a long period, then suddenly swell and burst into flower simultaneously. In *S. moorei* (and to a lesser extent in *Rhinerrhiza*) flowering occurs in bursts with a length of several inches of raceme flowering at one time followed some weeks later by another section.

The most interesting feature about the flowering of this orchid is the timing. Every plant in the area (some square miles) comes into flower on the same day and as they last only a day one has to be there on that day or miss out entirely. How do they do it? Plants growing low down in the forest in full shade, others higher up on trees on stream banks, half a mile apart — somehow they all "know" which day to flower on!

Culture: *S. moorei* is, because of its semi pendulous habit, best grown on a slab. A rather large slab of cork or similar long lasting material is best. It should be grown low down near the bushhouse floor in shade and should be kept in humid conditions all year. In Brisbane heat is essential during winter.

Who's Who

THE AUSTRALIAN NATIVE ORCHID SOCIETY OFFICERS AND GROUP CONTACTS:

ANOS Council

President: J.A. Walker; Vice-Presidents: E. Gordon and L. Bradford; Secretary: K. Edwards; Assistant Secretary: Ms M. Shelley; Treasurer: P. Collin; Editor: J.J. Betts; Assistant Editor: P. Weston.

ANOS Group Officers and Affiliated Societies.

NEW SOUTH WALES:

- *Sydney Group:* President: J. Walker (Tel. 419 2529)
  Meets 8 p.m. 2nd Friday each month, Ryde School of Horticulture, 59 Parkes Street, West Ryde.
- *Warringah Group:* President: E.G. Gordon (Tel. Business: 764 2215, Home: 939 6726)
  Meets 8 p.m. 2nd Thursday, Stony Range Flora Reserve, Pittwater Road, Dee Why.
- *Newcastle Group:* President: W. Moloney, 11 Crestwood Place, Warners Bay, 2282. Secretary: Mrs. Susan Herd
  Meets 4th Wednesday, John Young Community Hall, Thomas Street, Cardiff.
- *Wollongong and District:* Secretary: Mrs. Y. Parkinson, 23 James Road, Corrimal 2518.
  Meets 2nd Tuesday at the Meeting Room of the Wollongong Town Hall.
- *Hastings Valley Group:* Secretary: Mrs N. Blanch, RMB60, Pappinbarra Road, Beechwood, 2446.
  Meets 7.30 p.m., 4th Friday at Beechwood Methodist Church Hall.
- *Blue Mountains and District Orchid Society (Affiliated):* President: K. Edwards (Tel. 21 8126), Secretary: M. Wilde (c/- 20 Pembroke Street, Cambridge Park).
- *Cumberland Orchid Circle (Affiliated):* Secretary: Rayden Rivett, 33 Woodlands Street, Baulkham Hills 2153. (Tel. 639 4156). Meets 4th Wednesday.

VICTORIAN GROUP:

- Secretary: Mrs R. Wootton, (Tel. 754 6585). Meets 8 p.m. 1st Friday, the National Herbarium, Royal Botanic Gardens, Melbourne.

QUEENSLAND:

- *Darling Downs Group:* Secretary: Dr N. Grundon (Tel. 35 2570). Meets 7.30 p.m., 3rd Friday at the Auditorium, Technical and Further Education Centre (Extension Services Annexe) 54 Neil Street, Toowoomba.
- *Native Orchid Society of Queensland (Affiliated):* President: Dr P.S. Lavarack, Secretary: Mrs V. Swaffer, c/- P.O. Box 159, Broadway, Queensland 4000. Meets 8 p.m., 1st Monday at Bread House, 49 Gregory Terrace, Brisbane.

SOUTH AUSTRALIA:

- *Native Orchid Society of South Australia (Affiliated):* Secretary: E.R. Hargreaves, (Tel. 293 2471 or 297 3724) Meets 4th Tuesday, Goodwood Boys' High School, Hardy Street, Goodwood, Adelaide.
- *Northern & Eastern Districts Orchid Society (Affiliated).* Secretary: W.G. Joffre Keen, 22 Campbell Street, Oaklands Park, South Australia 5046.

WESTERN AUSTRALIA:

- *W.A. Native Orchid Study and Conservation Group (Inc.) (Affiliated):* Secretary: Ms L. Penny, Unit 6, 63 Fourth Avenue, Mt. Lawley, W.A. 6050. Meets 1st Friday at the Dept. of Agriculture's Film Room, Jarrah Road, South Perth.

NORTHERN TERRITORY:

- *Darwin Orchid Society of N.T. (Affiliated):* President: Mrs R.L. Bromwich, Secretary: Mrs G.C. Heinemann, P.O. Box 38493, Winnellie, N.T. 5789.

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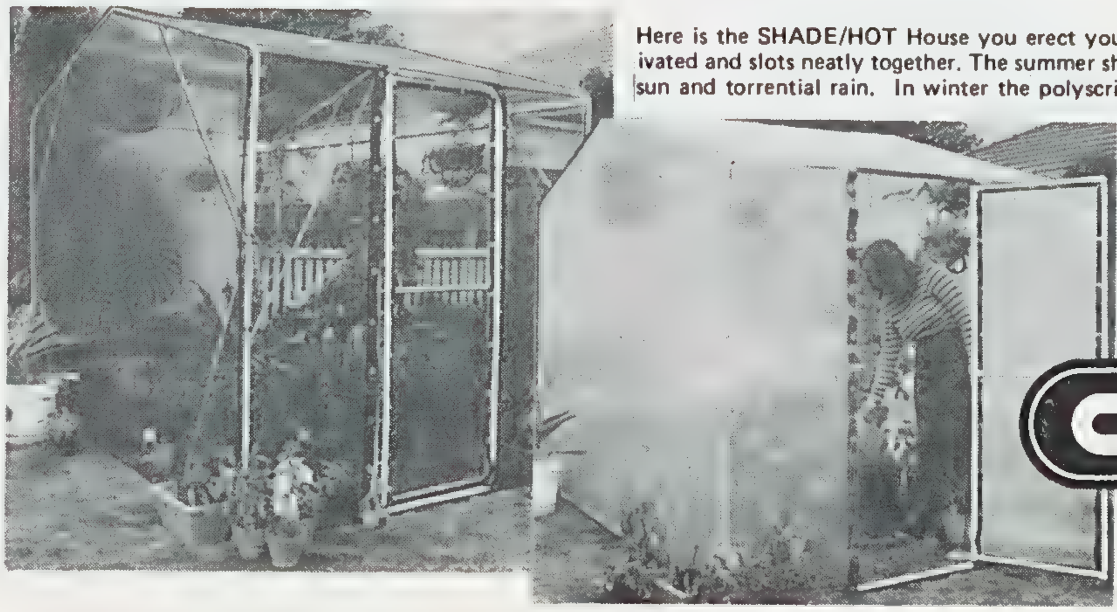

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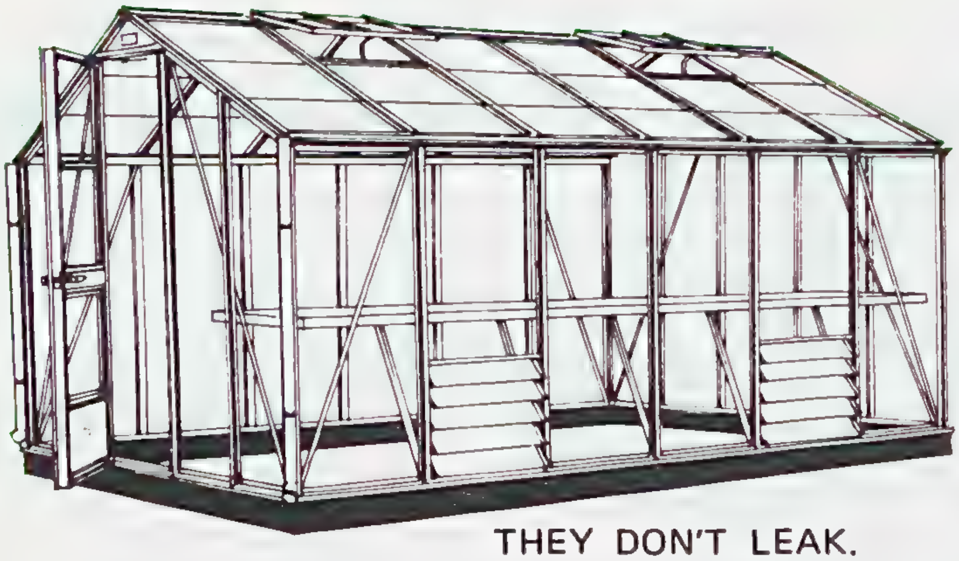

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A.N.O.S. Proposed Constitution — 13th March, 1979

THE AUSTRALASIAN NATIVE ORCHID SOCIETY

CONSTITUTION

INTERPRETATION

The "Society" means the Australasian Native Orchid Society hereby constituted.

The "Council" means the collective body of members for the time being elected by an Annual General Meeting to govern the Society.

"Member" means an individual member of the Society.

"Year" shall mean the period commencing 1 July and ending the following 30 June.

"Native Orchid" shall mean an orchid native to Australasia.

"Australasia" shall be defined as referring to the Commonwealth of Australia and all its Territories at the date of this constitution, together with New Zealand, New Caledonia, New Hebrides, Fiji, Papua and New Guinea including the Bismarck Archipelago and the Solomon Islands, West Irian, all islands south-east of a line joining 0° Latitude 130° East Longitude and 20° South Latitude and 120° East Longitude, and all islands East of Australia to the International Date Line and South of the Equator.

"Native Orchid Hybrid" shall mean an orchid, the parents of which are exclusively native orchid species or hybrids derived therefrom.

Words importing the singular number only shall include the plural number and vice versa and words importing the masculine gender will include the feminine gender, and vice versa.

OBJECTIVES

1. (i) To promote the culture and propagation of native orchids.
   (ii) To assist in the preservation of native orchids in their natural habitat and to discourage the wanton destruction of same.
   (iii) To promote the scientific and cultural knowledge of native orchids.
   (iv) To publish, edit and review literature and all writings that are approved by the Society, appertaining to the recordings, propagating, culture and science of native orchids.
   (v) To print and publish pamphlets and periodicals that the Society may consider desirable for the promotion and furtherance of any of its objectives.
   (vi) To engage in any activity that would further the wellbeing, and increase the knowledge of native orchids.
   (vii) To increase the membership of the Society by creating a public interest in the Society's activities and proceedings.
   (viii) To establish and maintain standards for the judging of native orchids and their hybrids and to train judges to apply these standards.
   (ix) To establish and maintain awards for native orchids and their hybrids.
   (x) To invest and deal with the money and property of the Society in such manner as may from time to time be thought fit.

MEMBERSHIP

2. Membership shall be open to all persons.

3. Membership of the Society shall be granted only by and subject to the approval of the Council.
   Application to be made in writing.

4. (a) The Council may, by a three-quarter majority of all its members, terminate the membership of any member without assigning any reason therefore, provided that: —
   (i) The Council at a preceding meeting has resolved that the Member be called to a Council meeting on a stipulated date.
   (ii) Such member shall be entitled to appear in person before and address the Council prior to the vote being taken on the proposed membership termination.

   (b) For the purpose only of sub-clause (a) of this clause, the President shall have no casting vote, but only a deliberative vote.

   (c) The Council in lieu of terminating the membership of a member as set out in sub-clause (a) of this clause, may suspend from the benefits of membership the member for such period as they might deem appropriate, or alternatively in lieu, take such disciplinary action against such member as they might deem appropriate, providing, however, that the requirements of sub-clause (a) and (b) of this clause shall otherwise apply.

   (d) Every person ceasing to be a member of the Society, whether by resignation, cancellation of membership, or otherwise, shall forfeit ipso facto all rights to or claims upon the Society and its property but shall subject to the proviso hereinafter contained, nevertheless remain liable for and shall pay to the Society all money which at the time of his ceasing to be a member may have been due by him to the Society and return any property held by him and owned by the Society PROVIDED ALWAYS that the Council may in its discretion remit the whole or any part of such money which may have been due by such person and may refund to such person the whole or any part of any yearly subscription already paid in advance by such person.

5. There shall be no numerical limit to the membership of the Society.

6. The Council of the Society shall elect a Patron, being a person who by his position in the community, shall add prestige to the Society.

COUNCIL

7. There shall be a Council for the management, conduct and control of the activities, business, property, and affairs of the Society. The Council shall consist of: —

(a) Not more than twelve (12) members elected annually by the members personally present or by proxy, from amongst their numbers. The officers of a full Council shall be

One President
Two Vice-Presidents only one of whom shall have been a past President
One Secretary
One Assistant Secretary
One Treasurer
One Editor
One Assistant Editor
Four Councillors

(b) The Immediate Past President of the Society, so long as he remains a Member, shall have the right to remain a member of the Council without holding any office during the succeeding President's term of office.

8. (a) The committee shall hold office for a period of not more than one year and shall be elected not later than August of each year. All committee members shall retire annually but shall be eligible for re-election.

(b) Each candidate for election to the Council shall be a member of the Society and shall be proposed and seconded by two (2) financial members.

9. (a) The election of the Council shall be conducted by two electoral officers appointed by the Annual General Meeting.

(b) If there is a tie for any position on the Council, the position or positions shall be decided by the casting vote of the immediate Past President or failing him, the immediate past Vice-President, who was a former president.

10. The new Council shall meet within 30 days of election.

11. The President shall not hold office for more than three full consecutive council terms and no members of council shall hold office on Council for more than nine consecutive Council terms.

12. Extraordinary vacancies on the Council shall be filled by the Council as soon as practicable after the vacancy shall have occurred, and the appointee shall hold office until the next Annual General Meeting.

13. The Council shall meet at least once every two months. In addition the President may of his own discretion call a special meeting of the Council at any time. Not less than twenty-four hours' notice shall be given of all Council meetings specifying the date, time, place and general nature of business of such meetings.

14. Subject to clause 4 hereof, the President shall have a deliberative and casting vote; every other member of the Council shall have only one vote which may be exercisable by proxy, evidenced in writing and signed by the Councillor.

15. A quorum for a meeting of the Council shall comprise a number equal to the next whole number above 50% of the Council for the time being.

16. Any person may, at the discretion of and with the permission of the President, attend meetings of Council as an observer.

17. Any financial member may be co-opted by the Council for service on any sub-committee that the Council may appoint.

18. If any Councillor should absent himself from three consecutive Council meetings without obtaining prior Council approval, he shall be deemed to have vacated his office.

19. A resolution in writing, signed by all the members of the Council, shall be as valid and effectual as if it had been passed at a meeting of the Council duly called and constituted.

FINANCE

20. The financial year of the Society shall be as defined.

21. The Society shall be responsible for and have control of its own funds, assets and liabilities. Each year following 30 June, an audited Balance Sheet shall be presented to the Annual General Meeting and be published in the Society's Journal.

22. (a) All moneys, cheques, bills of exchange or negotiable instruments received by or on behalf of the Society shall be paid into a banking account in the name of "The Australasian Native Orchid Society". Payments from the banking account shall be made only with the authority of the Council.

(b) All cheques drawn on the Society's banking account shall be signed by any two of the holders of the offices contained in clause 7 (a) as determined by Council but not the Secretary and Treasurer jointly.

23. (a) The annual subscription payable in advance by each Member of the Society shall be as determined by the Council from time to time.

(b) Members whose subscriptions are in arrears for more than six (6) months automatically cease to be members.

(c) The Council shall have the power to re-admit to membership of the Society a former member of the Society whose membership has lapsed.

24. The Council shall have the power to charge new members pro rata membership fees.

GENERAL MEETINGS

25. An Annual General Meeting shall be held not later than August of each year on such date as shall be fixed by the Council. All other special general meetings called by the Council shall be called Extraordinary General Meetings.

26. An Extraordinary General Meeting may be called by the Council at any time and shall be called by the Council upon the requisition in writing signed by ten (10) members within twenty-one (21) days of the receipt by the Secretary of such requisition. If such Extraordinary General Meeting be not called within the said period of twenty-one (21) days, then any three (3) of the requisitioners may call the meeting.

27. Ten (10) members personally present shall constitute a quorum for any general meeting, except at an Extraordinary General Meeting called by the Members when a quorum shall be twenty (20). Every member personally present shall be entitled to one vote on every resolution submitted to each meeting and such vote may be exercisable by proxy on the prescribed form.

The President shall be the Chairman of any such meeting or in his absence one of the Vice-Presidents shall be such Chairman, and the Chairman shall have a casting vote in the event of an equal vote being recorded for and against a motion.

INTERNAL ORGANISATION

28. The activities and operation of the Society shall be carried out by the Council or sub-committee or in such other way as the Council may from time to time determine.

29. The quorum for any sub-committee shall be three (3) members personally present.

30. All recommendations, reports or resolutions requiring or involving an approach to any Government or Public Authority or requiring or involving any public action or incurring or likely to incur any financial liability on the Society shall be referred to the Council for approval.

31. No public statement of policies shall be made to the press or any other medium by the Society except on the authority of the President and Vice-Presidents.

AUDIT

32. The Annual General Meeting shall appoint an Honorary Auditor.

33. Once at least every year the accounts of the Society shall be examined by the Auditor and a certificate as to correctness or otherwise shall be given. The Auditor shall have at all reasonable times access to all books, papers and documents of the Society.

34. The Society's balance sheed and/or statement of income and expenditure, together with the auditor's report mentioned in the preceding clause and any report accompanying it or attached thereto shall be read aloud by the Treasurer or such person as the President directs at the Annual General Meeting.

GENERAL

35. (a) The Society may organise any function or activity which the Council considers will further its objects.

(b) The Society may negotiate and conclude arrangements, including affiliation, with those associations with similar objects.

36. All notices to be given to any member pursuant to this Constitution or otherwise shall be properly given if posted by ordinary prepaid surface post to the last known address of the member. Such notice shall be deemed to have been received on the third day after posting.

37. The Council may refer any matter or thing to a sub-committee or any group for report or action and for that purpose may delegate any powers deemed necessary and not inconsistent with this Constitution.

38. Subject to this Constitution regulations may be made by the Council for the better conduct and efficiency of the Society.

39. In the event of a general meeting or an Extraordinary meeting of the members deciding that the Society be wound-up or for any reason whatsoever, the Society be wound-up or cease to function, all assets will become the property of a society with similar objects, such society to be decided upon by the Council.

40. The Society is prohibited from making any distribution of assets whether in money, property or otherwise, whatsoever to its members, prizes excepted.

41. All expenses of the officers, council and members reasonably incurred on behalf of the Society for stationery, printing, postages and for other contracts and things expressly authorised by the Council shall be paid out of the funds of the Society. No member or officer shall receive any remuneration for any services rendered on behalf of the Society, nor shall they be personally liable for debts legally incurred on the Society's behalf.

42. The Society may appoint delegates to attend meetings of affiliated societies and at least one of the delegates shall be the President or a Vice-President.

43. Every member shall be supplied with a copy of this Constitution on application to the Secretary.

44. The Society shall publish a journal known as "The Orchadian" to be issued to members free of charge at quarterly intervals.

45. The Society shall encourage the formation of Groups throughout "Australasia" and shall offer any assistance thought necessary to achieve this end.

JUDGING

46. The Council may provide standards for judging native orchids and native orchid hybrids. These standards shall be the criterion for judging at Society functions.

47. The Society may provide courses of training for judging by the Society's standards. The successful candidates may be appointed by Council to a position of Judge, at such levels as may be determined from time to time.

48. The training course shall be conducted by a committee of Judges one of whom shall be designated Registrar. No candidate shall be appointed by Council to the position of Judge unless on the prior recommendation of the Judging Committee.

49. The "Registrar of Judges" shall be elected by Council and shall be entitled to attend council meetings; however, he shall not have a vote unless specifically invited to vote.

50. The Registrar of Judges shall be responsible for the conduct of the judging course, the examination of candidates and the selection of judges for particular assignments. He shall maintain a register of all Society judges and shall supervise the judging of plants for awards.

LIFE MEMBERS

51. The Council may recommend to the Annual General Meeting that a member, whose conduct and service to the Society has been of outstanding value, be elected a life member. Such Life Membership to carry all the rights and obligations of ordinary membership with the exception of payment of annual subscriptions.

AMENDMENTS TO CONSTITUTION

52. Any part of this constitution may be amended by a General Meeting or an Extraordinary General Meeting of the Society provided that:

(a) At least thirty (30) days' notice has been given to members of the motion proposing the amendments and the general nature thereof, and,

(b) The motion is carried by a three-quarter majority of those entitled to vote, being personally present or by proxy.

53. The form of proxy is as follows: It should be prepared in writing, signed by the member concerned and must be in the hands of the Secretary prior to the commencement of the General Meeting.

PROXY FORM

I, ...

of . . . .

being a member of the Australasian Native Orchid Society

HEREBY APPOINT

(i) . . . . *of* . . . .

OR FAILING HIM

(ii) . . . . *of* . . . .

OR THE PRESIDENT AS MY PROXY TO VOTE AND OTHERWISE ACT ON MY BEHALF AT THE EXTRAORDINARY / ANNUAL MEETING OF MEMBERS TO BE HELD ON . . . . *19* . . . . . *AND AT ANY ADJOURNMENT THEREOF.*

Signed this . . . . *day of* . . . . *19* . . . . .

. . . .

Member's Signature

Journal of the

Australasian
Native
Orchid
Society

Patron: James H. Willis

The Orchadian

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- 7 AUG 1979

Dedicated to the study and care of
Australasian indigenous orchids

Dendrobium fleckeri

JUNE, 1979

Vol. 6, No. 4 *Registered for posting as a publication — Category B.* *Price: $1.00*

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Officers of ANOS Council:

President: J.A. Walker
Secretary: K. Edwards
Treasurer: P. Collin

Please address all correspondence on membership, change of address, announcements by Groups and Affiliates, etc. to the Secretary at the above address.

On all editorial and advertising matters please write to: J.J. Betts, 33 Memorial Avenue, St. Ives, N.S.W. 2075.
Articles should be typed in duplicate preferably on A4 size paper; double spaced with 4cm or more lefthand margins.

ANOS annual membership is $7.00 which includes family membership and covers four issues of this journal.

Available from the Secretary at $2.00 each (overseas Aust. $2.50) are ANOS badges depicting the blue sun orchid, *Thelymitra ixioides*.

Local Groups of ANOS

- Sydney
- Warringah
- Hastings Valley
- Newcastle
- Wollongong
- Darling Downs (Qld.)
- Victoria
- Central Coast

Affiliated Societies

- Blue Mountains & District O.S. (NSW)
- Native O.S. of Queensland
- Native O.S. of South Australia
- W.A. Native Orchid Study & Conservation Group (Inc.)
- Darwin O.S. of N.T.
- Others are listed by States inside back cover.

In general **Group** meetings are concerned with native orchids exclusively.

Affiliates are generally devoted to exotic orchids, but have a particularly strong interest in Australasian natives as well.

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Back Issues of *The Orchadian* are available from the Secretary at $10 (Aust.) per volume. Within Australia add postage charge of 80 cents per volume. For overseas postage by surface mail, plus packing, add $2 (Aust.) per volume. At present Vol's. 2 to 5 only are available, each volume comprising 12 unbound issues. Single copies are at $1 (Aust.) each (plus postage 35 cents).

Membership Renewal: Subscription renewal notices for the year July, 1979 to June, 1980 are enclosed with this issue. If you have sent your cheque within the past few weeks, please ignore the notice. Otherwise, please remit to the Hon. Treasurer NOW to ensure you continue to receive the journal.
Please note that ANOS annual membership is now **$7.00.**

Overseas Subscribers: Please remit by **bank draft** or international money order. (If payment is made by personal cheque, you must add $1.00 (Aust.) to cover bank charges.) Surface mail is used unless you request airmail, for which you must add the following rates to the annual subscription for four issues: N.Z. and P.N.G. $3.20; India and Japan $5.20; U.S.A. $6.00; Africa, U.K. and Europe $6.80.

All amounts are expressed in Australian Dollars.

THE ORCHADIAN

Founded August, 1963

Editor: J.J. Betts

Honorary Associate Editors: Dr N.J. Grundon (Qld.), Mr J. Simmons (S.A.)

Volume 6 June, 1979 No. 4

EDITORIAL

By the time this page is first read by "orchidians" (the spelling I should prefer — as used by Rupp in one of his letters to Fordham) I shall be away from Australia. The finishing touches to this issue will have been done by Peter Weston, our Assistant Editor. Apart from a few weeks he must spend in Canberra during June, Peter will also be putting together the whole of the September issue. I appeal to all contributors — both old and new — to make Peter's job easier by sending him articles and letters without delay. If possible, this should be no later than the first week in August. Remember that even a late article, if accompanied by appropriate illustrations, will save the Editor much valuable time and effort on your behalf. So much for the immediate future . . .

Now for the present. Thinking of Dr. Lavarack's article, in the March issue, on Conservation as a Matter of Conscience, we give you a few short pieces from Peter Vaughan ("Epiphytes with Pleasure", "Notes from Bonalbo", and "The Orchids of Lamington National Park"). At first sight the Bonalbo piece may alarm you. For example, when he writes: "In our steady organised collecting (perhaps more reminiscent of a shark's feeding frenzy) we collectively stripped each tree of its orchids (some say we put plague locusts to shame)." Remember Bill Lavarack's plea for conscience? Remember, too, that this purple passage of Peter Vaughan's first appeared in the May issue of "Native Orchid News", journal of the Darling Downs Group of ANOS! Can the writer be serious? We leave it to you to judge. There is more in Peter's articles than meets the eye at first glance. He should be renamed "Hawk-eye Vaughan". We are seeking more from him.

It is of course bad news that we have to increase our subscription fee from $5 to $7 from 1st July, 1979. This follows careful discussion by ANOS Council's Budget Committee and by the full Council. It is not unexpected in view of the continuing trend of monetary inflation. The rise was inevitable even if we had not upgraded the quality of *The Orchadian.* We feel, that this *fait accompli* must soften the blow and also that the journal's improvement has brought with it an increasing enthusiastic membership which will extend the period that elapses before another rise threatens us.

After all, as one member of Council put it: The rise is about equal to the price of two packs of cigarettes or three bottles of beer. Anyhow, it would not buy you one orchid plant of any size.

PROPOSED CONSTITUTION:

You were advised in the December issue that members at the Annual General Meeting had instructed Council to prepare a new Constitution.

The proposed Constitution was forwarded to you with the March Orchadian and to pre-empt any problems you may have, I wish to make the following comments: —

1. It was considered unrealistic to try to make orchid distributions fit into political boundaries, therefore in the definition of 'Australasia' we have included some of the Indonesian Islands and West Irian. The north-west boundary has been chosen as one which passes through the least land masses.
2. The Objectives remain almost unaltered.
3. The maximum size of Council has been increased by the addition of four Councillors and the removal of Record Secretary. The maximum size has not been set as the minimum Council.
4. Most societies provide for the President to serve a fixed term, a sentiment with which Council fully agrees. We also feel that it is reasonable for the Councillors to have a fixed term and thereby ensuring a steady growth and flow of ideas.
5. This Proposed Constitution provides for the election, by members, of an Honourary Auditor.
6. The method of voting has been rationalized. Members will be able to send in a Proxy — provided it is in the same format as that at the end of the Proposed Constitution. The object of this change is to reduce the work load of the Secretary and to cut administrative costs.
7. Safeguards are built into the Proposed Constitution both for members and Council. In our view it is now more difficult for a clique to either control Council or throw out a duly elected Council; the power has been fairly placed with you, the member.

The remainder of the paragraphs are fairly standard to any Constitution and in many cases are merely rewrites of old paragraphs.

Council feel that we have presented to you a businesslike, modern, fair and efficient Constitution, one which will aid the operation of the Society from the point of view of Council and the Membership and accordingly I on behalf of the Council commend it to you.

JAMES WALKER, President

NOTICE is hereby given of an Extraordinary General Meeting to be held at the Ryde School of Horticulture, 59 Parkes Street, West Ryde, on 1st September, 1979 at 10.00 a.m.

The purpose of the meeting is to consider and, if thought fit, pass the following resolution, which is proposed as a special resolution: —

> "That the Proposed Constitution of the Society as circulated to members in the March, 1979 issue of *The Orchadian* be and is hereby adopted as the Constitution of the Society."

Members may vote by being present at the meeting or by completing the Proxy Form accompanying this issue of *The Orchadian.*

By Order of this Council,

K. EDWARDS, Secretary

NOTICE is hereby given of an Annual General Meeting to be held at the Ryde School of Horticulture, 59 Parkes Street, West Ryde, on 1st September, 1979 at 10.15 a.m. or immediately following the Extraordinary General Meeting, called for 10.00 a.m.

Closing date for nomination of candidates for election to Council is THURSDAY, 19TH JULY, 1979.

Date of election (polling day) is Thursday, 30th August, 1979.

J. HILL, G. WELLS, C. FURRO
Election Returning Officers

(Council has proposed that a barbeque be held at Muogamarra Nature Reserve after the A.G.M. All members welcome — bring your own food and refreshments.)

The Genus *Dipodium* R.Br. in Australia

by M.A. Clements

Abstract:

Five species of *Dipodium* R.Br. are thought to occur in Australia. Their general morphological differences and distribution are given. The status of both names and species is discussed but reference is made to the problems of not reviewing the "type" specimens of each species.

The cultivation, at the National Botanic Gardens, Canberra, of all species and the possible mycorrhizal relationship of each species are also discussed.

Introduction:

The genus *Dipodium* R.Br. is closely related to the well known orchid genus *Cymbidium* Sw. They both belong to the subtribe Cymbidiinae of the tribe Vandeae. The difference is in the structure of the pollinium. In *Dipodium* R.Br. each pollinium is separately attached to a long stripe while in *Cymbidium* Sw. the pollinium is joined by a common short caudicle (Dockrill 1969). Both genera have representatives of epiphytic, lithophytic, terrestrial and saprophytic vegetative forms. Of the five *Dipodium* species that occur in Australia one is an epiphyte and/or a lithophyte for at least part of its life, one is a terrestrial with leaves and three are saprophytic terrestrials.

They are distributed mainly around the northern and south-eastern coasts (see Map 1) and appear not to have reached the south-west of Western Australia. Interestingly, another saprophytic species commonly found in south-east Australia *Gastrodia sesamoides* R.Br. is also found in south-west Western Australia.

All the Australian Dipodiums have colourful flowers. Few tropical terrestrial orchid species can match the beauty of *Dipodium ensifolium* F. Muell. when in full flower. Similarly *Dipodium punctatum* (J.E.Sm.) R.Br., is a striking orchid species when encountered in the generally drab bush during the summer months. The other species are equally impressive when in full flower.

To date only the two green leaved species have successfully been cultivated, although many people have tried in vain to cultivate at least one of the saprophytic species, namely *D. punctatum*.

The botanical status of each Australian species, in particular the saprophytes, has not been settled. I am not aware of any botanical review having been done on this genus and until that occurs there will be doubt as to the precise name for each species. However, I believe that there are at least five if not six naturally distinct populations occurring in Australia and this paper is aimed at pointing out the distinctness of these populations at a not too technical level, so that all readers can quickly recognise each species should they encounter them in the wild.

The article is also aimed at updating what little is known about the cultivation of these plants from seed and the mycorrhizal association they have with certain species of fungus.

1. Vegetative Variation:

The variation in plant form of members of this genus was noted by Dockrill (1969) when he stated: "Plant terrestrial and of diverse form . . ."

Three distinct forms occur and these are: —

1.1 Erect stemmed plants with leaves; terrestrial and probably semi-saprophytic -- *D. ensifolium*.

1.2 Climbers with blade-like leaves and stems that grow indefinitely; plants starting life as a terrestrial — *D. pandanum* F.M. Bail.

1.3 Leafless saprophytes, inflorescence the only part of the plant that normally shows above ground level — *D. punctatum, D. hamiltonianum* F.M. Bail., *D. stenochilum* O. Schwarz.

2. The species in Australia:

Dockrill (1969) initially listed three species occurring in Australia with a possible fourth, *D. pandanum,* in a footnote to the generic description. The latter has since been verified and was officially added to the Australian orchid species list in Australian Plants Vol. 6, pp. 34-35.

However, when reviewing the recent Australian literature on the species it was obvious that agreement as to the status of some species had not been reached. Clemesha when replying to Nash (1968) about the status of *D. hamiltonianum* agreed with the latter's treatment of referring to these plants as a variety of *D. punctatum.* In fact, Bailey himself had changed his mind by reducing *D. hamiltonianum* to a variety of *D. punctatum* less than two years after his original description. Nash (1968) further suggested that *D. hamiltonianum* could be an "older and more fixed form" of *D. punctatum,* Logan (1971) agreed with Nash on this point. Howcroft (1969) added further to this discussion of status by suggesting D. *hamiltonianum* "may only be an ecotype of the species", namely *D. punctatum.*

Jones and Logan (1971) went a long way to clarifying the position concerning *D. hamiltonianum.* They suggested that this plant was in fact a species in its own right, a determination that I believe will in time prove to be correct.

I was fortunate enough to see this same population of *D. hamiltonianum* that Jones and Logan used in their review. These plants compared closely with plants collected for the National Botanic Gardens, Canberra, from Coonabarabran, N.S.W. in 1976. The fact that *D. punctatum* and *D. hamiltonianum* both grew in the same area at Carabost would seem to dispel the idea of one being an "ecotype" of the other and the apparent uniformity of type over a wide distance would indicate that there were in fact two dinstinct species.

When working on the above mentioned species, Jones and Logan uncovered another problem of status within the genus. Two distinct forms of *D. punctatum* are known from around Sydney. Both are common and as Sydney is the type locality for *D. punctatum,* the question arose as to which form represents the "type" of the species and genus. This question has not been resolved and until this "type" specimen is examined and reported on, the answer will remain a mystery. J.E. Smith's collection is held by the Linnean Society, London.

In February, 1978 I was fortunate enough to visit some northern parts of the Northern Territory including Arnhem Land. While there I encountered many plants of what I believe is *Dipodium stenochilum.* The status of this species has also been the subject of review. Rupp (1944) advocated the reduction of this species to varietal status under *D. punctatum.* In reading his paper on the subject it is not clear if he, in fact, examined Schwarz's "type" specimen. He first gives the impression he had when he stated that specimens of *D. punctatum* from Queensland, N.S.W., Victoria, Tasmania and South Australia were examined over a period of time "and comparing them with not only the specimens of *D. stenochilum* . . . but also with further specimens collected . . . in far northern parts of the continent". He goes on to say "specimens approximately identical in all respects with Schwarz's plant, *as interpreted by his description . . .*" I believe this last statement casts doubts on Rupp's having ever viewed the "type" of *D. stenochilum.*

Dockrill (1969) further reduced this plant in status to a synonym of *D. punctatum* as he pointed out the distinctions between the two had proved to be unstable. However, I believe these two authors overlooked one important point. Otto Schwarz, and not Schlechter as Dockrill states, was the author of *D. stenochilum* and the plants he described came from 30 miles East of Port Darwin at

Koolpingah. Both Dockrill and Rupp appear to have been dealing with North Queensland plants and not those from the Northern Territory. As stated, I believe this population of plants from the Northern Territory to be a distinct species, namely *D. stenochilum.* This opinion was formed from field collections and sightings in the Northern Territory and examination of the herbarium material in Darwin. The pink colour of the stem characteristic of the species was retained and clearly visible in the dried specimens.

The distribution of this species is interesting (see Map 1) as it is comparable to the distribution and speciation of *Dendrobium dicuphum* F. Muell. and *D. bigibbum* Lindl. A recent verbal report of a *Dipodium* being found in the Kimberleys, Western Australia, is also interesting and probably represents an extension of range of *D. stenochilum.*

The following is my interpretation of the species of *Dipodium* that occur in Australia:

2.1 *Dipodium ensifolium*
This species is easily recognised by its broad linear leaves, together with its terrestrial habit and flowers with rather narrow segments. The flowers are the most colourful of the Australian Dipodiums. It has a limited distribution in tropical Queensland (see Map 1).

2.2 *Dipodium pandanum*
This climbing species inhabits some limited areas in the northern half of Cape York Peninsula, Queensland, (see Map 1). It starts its life as a terrestrial and then climbs either boulders or trees in the immediate vicinity. Should a plant be dislodged from its host it will again climb the nearest available object. The flowers are pale yellow to cream in colour and spotted brown.

2.3 *Dipodium punctatum*
This plant is the most variable of all the Australian species, inhabiting a wide range of environments in the eastern and southern states (see Map 1) and is found mainly in open Eucalypt woodlands. This species is saprophytic, spending most of its life below ground and coming above only to flower and fruit. There are many colour forms, including the pure white flowered forms found at Upper Sturt in the Mount Lofty Ranges, S.A. and at Cleveland, Queensland.

As mentioned before, Jones and Logan (1971) pointed out that there were in fact two forms or varieties that could be found around Sydney. These two forms are variable and sometimes apparent intermediates occur but it is my experience that the two are distinct and easily separated.

2.3.1 **Large variety**
This plant has thick stems that are usually red or brown and up to 1m high. The flowers are spaced evently along the top half of the stem, usually pink with small darker coloured spots, sometimes without spots. The main flowering season is from early December to the end of January, depending on the locality. Distribution (see Map 1).

2.3.2 **Small variety**
This plant has thinner stems that are usually green to almost black at the base and becoming red to pink at the apex and up to 0.5m tall. The flowers are similar in shape but generally clustered near the apex of the stem, usually blotched instead of spotted and generally darker in colour, particularly the blotch which can be almost red in colour; generally two thirds the size of the larger variety. The main flowering time is from December to mid-February, depending on the area. Distribution (see Map 1).

There appears to be little difference in the flowers of the two variations of *D. punctatum.* These two probably represent two varieties of a single species.

2.4 *Dipodium hamiltonianum*
This species is easily distinguished from all others by its yellow-green coloured flowers. This saprophytic species inhabits a wide area of eastern Australia but apparently prefers slightly drier areas on the western side of the Great Dividing Range (see Map 1). The flowers are larger and more star shaped than those of *D. punctatum* and spread out along the spike.

2.5 *Dipodium stenochilum*
This species is confined to the northern portion of the Northern Territory (see Map 1), where it is common and widespread. It probably also occurs in the Kimberleys in Western Australia. The species is similar to *D. punctatum* but probably more closely allied to *D. ensifolium.* The flower colour is very similar to that of *D. ensifolium* though usually paler. The flower stem is pink to light yellow.

3. Cultivation (at the National Botanic Gardens, Canberra):

3.1 *D. ensifolium* has been successfully cultivated since 1972 in a single 12" pot of permanent pot mix (i.e. U.C. Mix + 25% additional leaf mould). This plant flowers regularly each summer. It is regularly fertilized during this active growing period of the summer and does well in a position that gets a lot of sun. It is kept dry during the winter months. It needs to be kept above a min. of 15°C all year round. It so far has proved difficult from seed, taking up to 12 months to show any sizable protocorms after sowing on Knudson C.
The thick, fleshy roots are similar to saprophytic members of the genus and although green leaves are present, I suspect that this plant is semisaprophytic at least.

3.2 *Dipodium pandanum* grows well as a pot plant in woodchips and small amount of charcoal. It is reminiscent of vandaceous species in culture, but will fall over and grow along the bench if not propped up. Our plants at the National Botanic Gardens are in flower for the first time. (March, 1979).
As yet, no seed has been available for germination trials.

3.3 The cultivation of any of the three saprophytic species has in the past proved impossible for periods of more than 12 months. This includes both mature plants collected in the wild and seedlings raised under aseptic conditions. However, recent experiments at the National Botanic Gardens, Canberra, have indicated that it may be possible to successfully grow these saprophytic species in cultivation. Both *D. punctatum* and *D. hamiltonianum* have flowered 12 and 24 months respectively, after collection, and examination of the plants has shown that new root growth has also occurred.
These species depend on their own mycorrhizal fungus for their food supply. This fungus can be found in their thick, fleshy roots in varying quantities all year round and in varying states of activity. When the plant is in flower, this fungus appears least active, often being exceedingly difficult to locate. This fluctuation in activity of the fungus is caused by the availability of nutrients and water. The bark of the roots of eucalypts appears to be the main source of food for the symbiotic fungi for the saprophytic species.
I would suggest that *D. ensifolium* would have a similar association. However, *D. pandanum* has thinner wiry roots similar to those of most epiphytes. The associated fungus would be predictably different. This latter statement needs confirmation.

Discussion:

I believe I have shown that there are five species and one variety of one of these five species occurring in Australia. The correct nomenclature of these species needs to be sorted out. This can only be done satisfactorily when all the "type" specimens have been examined along with review of the descriptions.

The use of colour as a diagnostic property is normally considered inadvisable. However, with this genus, and especially with the saprophytic members of the genus, colour (except in the case of albino forms) seems to be a consistent character that can be used along with morphology, ecology and distribution for species classification. Chemical analysis and comparison may one day assist in classification. Similarly the use of knowledge of pollinators, particularly if they are species specific, may also aid in the understanding and classification of the populations.

The distribution and evolution of these plants is worthy of attention. The obvious affinities that *Dipodium* has with *Cymbidium* were discussed earlier in this paper. Both genera appear to be of S.E. Asian origin, spreading east and then southwards into Australia. Consequently we see the greatest development of species occurring in the northern part of Australia and in Cape York Peninsula four species are present. Adaptation to the environment has allowed migration down the east coast and then as far as the Mount Lofty Ranges. After that suitable habitats almost cease to exist and the Nullarbor Plain appears to be a barrier to the West.

The most widespread species, *D. punctatum,* is also the most diverse in form, simply because it has more opportunity to express variation within its population. Consequently we see white forms appearing, as well as spotless forms and both large and small flowered forms. The small "variety" I have mentioned is the possible start to a newly forming species and may in fact already be a species.

The isolation and identification of the mycorrhizal fungi that occurs in the roots of these plants may in the near future add more information about the members of the genus and their particular species relationships.

ACKNOWLEDGEMENTS:

I would like to thank Dr. J.H. Warcup, C.S.I.R.O., Waite Agricultural Research Institute, Adelaide for discussion on mycorrhizal fungi isolated from some of these plants. I would also like to thank I. Morris, who first drew my attention to the Northern Territory member of the genus and R.C. Nash, who showed me the locality for the white South Australian form of *D. punctatum;* and the Australian Orchid Foundation, who assisted me to visit the Northern Territory. Finally, I would like to thank A.E. Logan, who kindly informed me that *D. hamiltonianum* was in flower and who accompanied me to its natural habitat.

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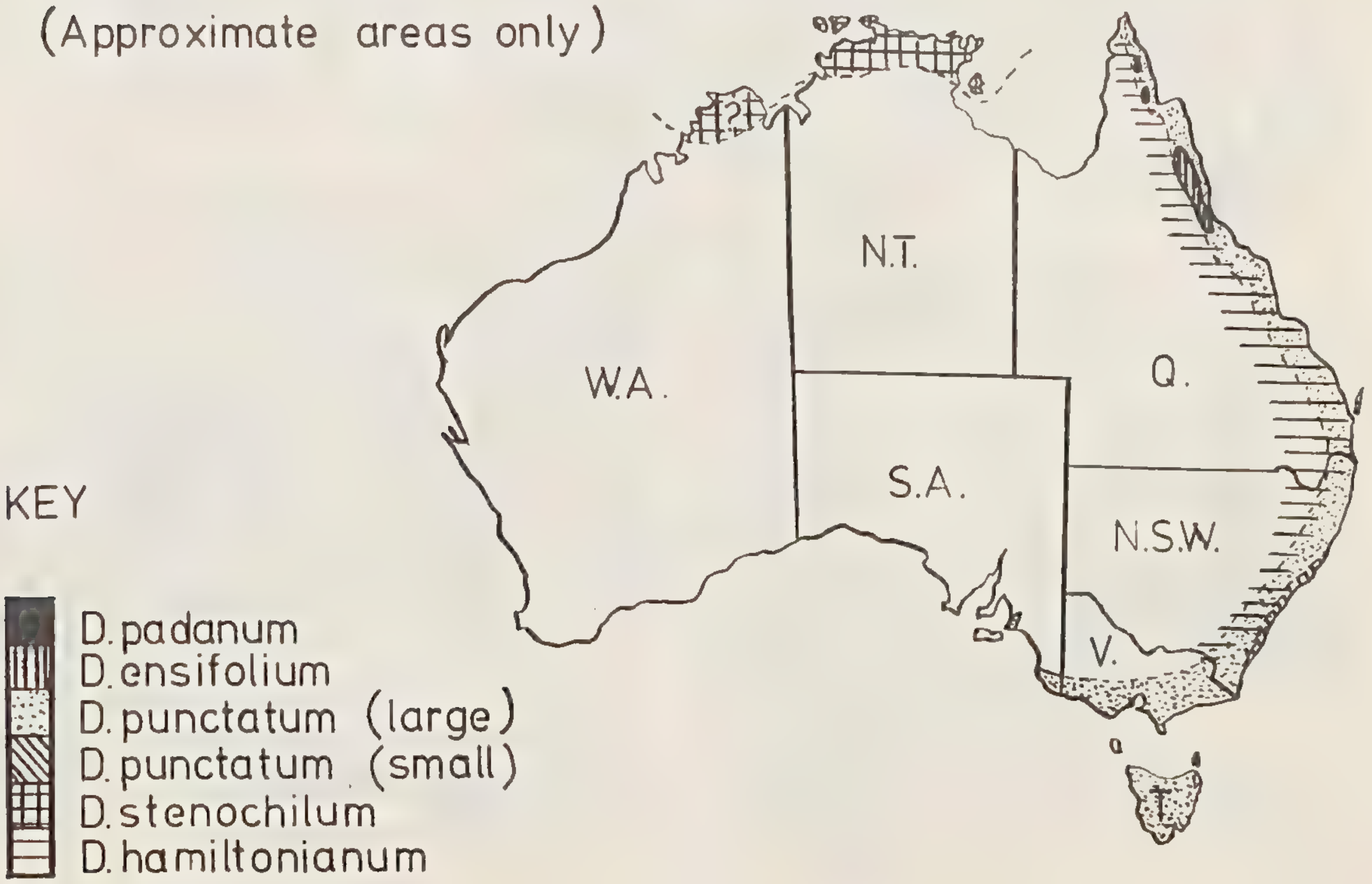
— NATIONAL BOTANIC GARDENS, CANBERRA

THE DISTRIBUTION OF DIPODIUM IN AUSTRALIA

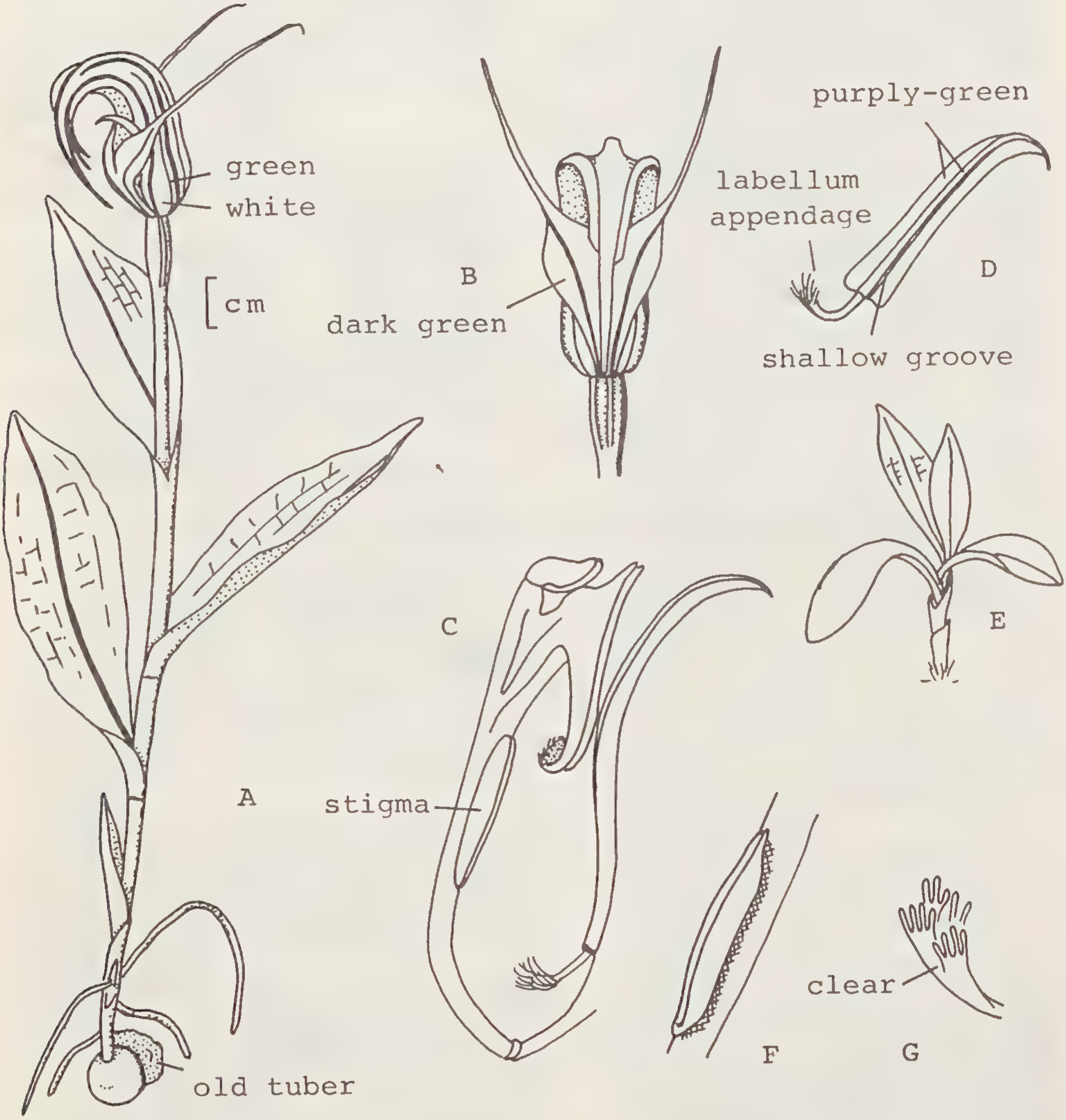


Native Orchids of New Zealand
4 - *Pterostylis oliveri* Petrie and *Pterostylis irsoniana* Hatch

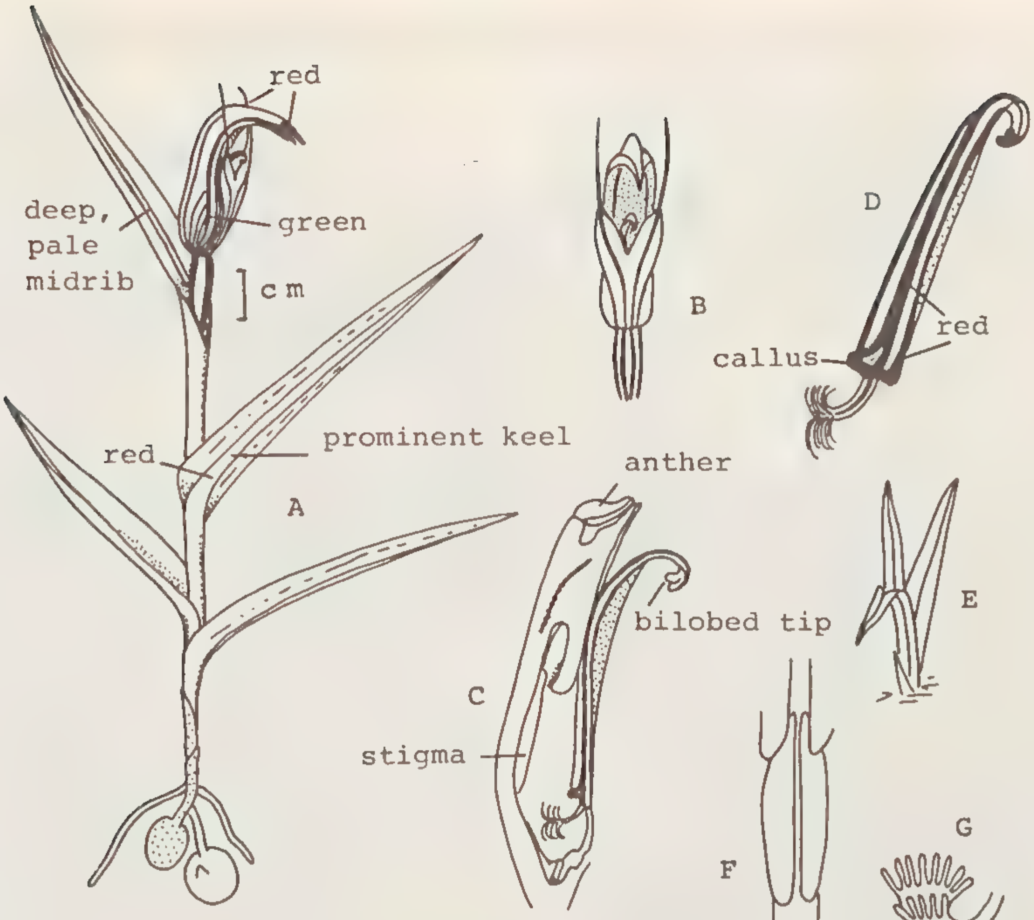
— by Dorothy Cooper

New Zealand has 13 species of *Pterostylis* that are thought to be endemic. Three are fairly small — *P. alobula*, *P. trullifolia*, and the rarer *P. brumalis*, the others are quite large. Two species in the latter group are very distinctive and easily recognised: *P. oliveri* and *P. irsoniana*.

Pterostylis oliveri Petrie 1893 is peculiar in that it seems to be restricted in occurrence to the Mount Arthur — Pikikiruna Range — Cobb Valley area of north-west Nelson, and to the Arthur's Pass — Otira region in Canterbury. There have been no reports of the species elsewhere. It was named after Professor D. Oliver, F.R.S. of Kew for his assistance to Petrie in his studies.



Pterostylis oliveri
A flowering plant
B flower, from front
C column and labellum
D labellum
E young plant
F stigma
G labellum appendage



Pterostylis irsoniana

A flowering plant
B flower, from front
C column and labellum
D labellum
E young plant
F stigma
G labellum appendage

It is very common in Cobb Valley, found mostly under *Leptospermum* scrub at 800 – 1000m, but occasionally in more open places beside creeks or in boggy areas and more rarely under beech forest canopy. It flowers during December – January, the flowers are usually solitary, but a second flower has occasionally been reported (D. Petrie, 1893).

Its growth habit identifies it unmistakably. The extremely long dorsal sepal (7-8cm) curves downwards often to the level of the ovary, while the lateral sepals, also long, curve backwards. The dorsal is 3cm high. The petals are usually much shorter than the dorsal and are broad almost to their tips. The lateral sepals have slender filaments 3.5cm long. The flower is pale green with darker green stripes.

Average height of the plant is 12 – 25cm but taller specimens occur if very shaded. Young plants form a semi-rosette expanding as it matures to form cauline leaves. There are 3 or 4 leaves which are unusually broad on mature specimens. They are set closer together at the base of the stem, the internodes widening upwards. A typical specimen has varied leaf lengths, the large basal leaf is 7.5cm long by 3cm wide, the one above is 9cm by 2.25cm and the uppermost is 8cm by 2cm. Lower leaves may have short stalks but the uppermost is sheathing and has none, it often reaches the flower but rarely overtops it. The leaves have reticulate veins.

The labellum is much taller than the column, and is a narrow, elongated triangle in shape, narrower at its tip. Its anterior portion arches forward and protrudes out of the front of the flower. The labellum appendage terminates in numerous narrow filaments. The stigma is long and oval, partly hidden under the lower lobes of the column wings.

Pterostylis irsoniana was first described from Mount Egmont in 1948 by E.D. Hatch, who named it after J.B. Irwin and O.E. Gibson for their work on the orchid flora of the mountain. We have found it to be locally abundant in Cobb Valley and it is also reported from the Wellington area (A.P. Druce and J.B. Irwin, 1951), although it is usually a species of higher altitudes. It is a smaller plant than *P. oliveri,* averaging 10 – 17cm high and is distinguished from all other species in the genus by its characteristic labellum.

It commonly has 3 or 4 long narrow leaves (6 – 10cm by 1cm) with a marked keel and a deep pale midrib. One of its distinguishing characteristics is its bright, jaffa-red markings on the flower, particularly the lateral sepals, on the leaf midrib and keel, on stem and ovary. Like *P. oliveri* it also flowers in December – January but is usually a little earlier, finishing before *P. oliveri.* A few plants are all-green but in the right situation, that is, fairly shaded, the red is very distinctive. We found it under beech forest in fairly damp, dark areas, but in one locaility where the plants were taller and paler, it was in sunlight for the first half of the day.

The upright leaves are set fairly close together and have a pink sheathing base, the upper leaf usually overtops the solitary flower. The dorsal sepal is 2 – 2.5cm high, its horizontal or incurved portion being relatively short. The broad petals are only a little shorter, their upper part is conspicuously red, while the caudae of the lateral sepals are also red, and are only a little taller than the galea. The flower otherwise is a translucent pale green with darker green stripes. The stigma is a little shorter than in *P. oliveri* and again is partly hidden under the lateral lobes of the column.

The labellum is conspicuous. Arched over, it protrudes out of the flower showing its characteristic dark red, swollen, knobbed tip curling downwards. It has a raised midrib and its lateral margins sometimes arch upwards. Another distinguishing feature is the large, dark callus at its base. This does not seem to occur anywhere else in the genus. The labellum appendage has several fine filaments commonly branching in two directions.

Young plants form a group of narrow pointed leaves, which as the stalk elongates, develop into cauline leaves.

**14 Avalon Crescent
LOWER HUTT, NEW ZEALAND**

THE ORCHIDS OF LAMINGTON NATIONAL PARK

by Peter Vaughan

Lamington National Park is a very popular tourist location on the Queensland border, within sight of the Gold Coast. The park incorporates a large area of the Macpherson Ranges and is a plateau with an average altitude of 1000 metres. Its southern cliffs from the NSW-Queensland border and many lookouts stand just below the 1,300 metre mark overlooking Mt. Warning in NSW. The aboriginals considered the plateau taboo, as it housed evil spirits, but even they had sacred trails across the top. The plateau's unique form prompted the Queensland Government in 1915 to proclaim 47,000 acres as the Lamington National Park, thus preserving it for posterity. The National Parks and Wildlife Service constructed many graded walking trails to most natural features so that even the most sincere armchair orchid grower need not fear the evil spirits.

The vegetation is predominantly virgin rainforest, but an antarctic beech forest holds the higher altitudes. The plateau is surrounded by a dry forest so the area incorporates a very wide range of habitats. The hoop pine is a common tree and some of our less common and more fascinating bulbophyllums are found associated with it. The orchids in this area are covered by a very informative booklet by Col Harman and include:

Bulbophyllum aurantiacum, B. bracteatum, B. weinthalii, B. crassulifolium, B. elisae, B. exiguum, B. globuliforme, B. minutissimum, Cymbidium canaliculatum, C. madidum, C. suave, Dendrobium aemulum, D. monophyllum, D. pugioneforme, D. beckleri, D. X delicatum, D. falcorostrum, D. gracilicaule, D. X gracillimum, D. kingianum, D. linguiforme, D. mortii, D. schneiderae, D. speciosum, D. tenuissimum, D. teretifolium, D. tetragonum, Rhinerrhiza divitiflora, Sarchochilus ceciliae, S. dilatatus, S. falcatus, S. fitzgeraldii, S. hartmannii, S. hillii, S. olivaceus, Pteroceras spathulatus, Papillilabium beckleri, Plectorrhiza tridentata, Liparis reflexa, L. coelogynoides, Calanthe triplicata and quite a variety of terrestials.

Accommodation consists of two modern guest houses, complete with armchairs, or well kept lawns for camping on, but you have to bring your own tent. Very good facilities are available for the camper including general stores and hot showers at the guest houses. Binna Burra Lodge caters for the camper better but O'Reilly's have an attraction for us all — the Orchid Sanctuary and Botanic Gardens.

Spectacular natural features abound, including many lookouts where lithophytes are found. *Sarcochilus hartmannii* occurs on the northerly and westerly aspects, while dendrobes are also common. Waterfalls are well marked on all the maps and are sufficiently signposted. Along these gullies and creeks the tree tops are lower and epiphytes can be seen more readily. Up some of the side creeks *S. fitzgeraldii* can be found and I am looking forward to seeing these flower in Spring. There are many waterfalls within a half days easy walk of the guest houses, O'Reilly's in particular. An easy day trip may get one to the antarctic beech forest where *D. falcorostrum* is plentiful. Plants can be seen here growing on other hosts as well as *Nothofagus moorei.* (Note: Stan Beaumont of Dorrigo has shown me photographs of numerous plants growing on rocks in a eucalypt forest.) Also in this Beech forest is the locally endemic *Pittosporum oreillyanum* which is very similar to the common spiky *Citrobatus pauciflorus* often found growing beside rainforest clearings. The pittosporum is only found growing in the Beech forests. Regrowth of Antarctic Beech Forests is a very slow process and some botanists believe that once destroyed, they will never re-establish as they were. Unfortunately, large areas of Beech forests in N.S.W. are being destroyed, logged by short sighted authorities. It is pleasing to see the southern and northern limits of *D. falcorostrum* protected by the Barrington Tops and Lamington National Parks respectively. The Hoop Pine *(Araucaria cunninghamii)* is the other tree that interests us all, as it is virtually the sole host for *Bulbophyllum weinthalii* and *B. globuliforme.* These two rare orchids have very restricted distributions, *B. globuliforme* being confined to the Macpherson Ranges. Hoop Pines are also favourable hosts for most other epiphytes as shown by the many old trees around the park.

Another attraction is the lookouts just off the road to O'Reilly's. Access to these takes one through a eucalypt forest, rich in terrestrial species. On my last visit *Pterostylis longifolia* and *P. curta* were in flower. One track through a brush box forest is very rich in *Calanthe triplicata* growing in very deep leaf litter.

Close to O'Reilly's is the Orchid Sanctuary, expertly cared for by Col Harman. From modest beginnings he has developed a very attractive botanic garden that contains most species of native orchids that survive the climate. Included in his collections is a very large plant of *B. bowkettae* along with *B. lageniforme,* another uncommon species. Fortunately, these plants are well hidden as his main losses are due to old ladies and young growers. Conditions in the sanctuary are so suitable that *S. ceciliae* has self sown itself profusely and visitors unknowingly walk on a lawn of *Pterostylis curta.* A recent find by Col Harman is *Pterostylis obtusa,* a new recording for the area. Other plants in the garden include over 20 different prosatheras, *Rhododendron lochae,* a large number of grevilleas, dryandras, proteas, waratahs and even tea plants (*Camellia* sp.). The standard of upkeep and number of plants is extremely good and a credit to Col Harman.

For a break from the plants, O'Reilly's also has some interesting wild-life, including semi-domesticated crimson rosellas, magpies, currawongs, satin bowerbirds, brush turkeys, and an occasional wonga pigeon which cannot yet be hand fed. Paddymelon wallabies and brush tail possums also abound and I have seen a pair of native cats hunting the bowerbirds. A night walk into the forest allows one to see glow worms and the occasional animal by torchlight.

Lamington National Park gives us all a chance to see rainforest in its natureal state without the danger of losing ourselves and it has many features of the area presented more simply in the cleared areas of the guest houses. We are fortunate that the Queensland Government in the past had the foresight to preserve this area. Perhaps we can look around now and see more areas in need of help.

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Letters to the Editor

An Open Letter to Growers
— Novice and Expert Alike —

Dear Readers,

Almost every issue of *The Orchadian* that is published has our editor calling for material suitable for publication.

Most of us are shy, scared to write in case we are cried down, afraid that our methods are not as good as other growers and assume that the same few people, who contribute regularly, will come through again.

Let us all, including our overseas readers and growers, make a concentrated effort to assist our editor to have abundant material from which to choose. Granted that possibly not all our materials will be published or used, we will know that we have made the effort and tried, and once we have made that initial effort, the next attempts will be a lot easier.

May I suggest that we as readers choose from 1 to 6 plants each, make weekly or monthly notes on what we did, how we did it and why we did it, fertilizers used, positions placed, temperatures, etc.

At the end of say six to twelve months we should have a record that we can relate to other growers and avid readers of *The Orchadian.*

If you are like me, and are keen to know better ways and means of growing then any information you may want, could appear in *The Orchadian* through our combined efforts.

I for one will be participating. Will you?

Yours faithfully,
E. HUSTED
21st May, 1979 — 81 Darvall Road
Phone: 85 4678 — WEST RYDE, N.S.W. 2114

(If the response to this letter grows in volume, we shall be glad to expand it beyond "Letters to the Editor" to a special feature headed "Growing Techniques" or "Readers' Information Exchange". If you find writing is a chore, why not telephone Erhard Husted, and through him get your good ideas or your problems into the exchange situation? — Editor)

DENDROBIUM BEETLE

Dear Sir,

I read in "Letters to the Editor", in the September, 1978 issue, of *The Orchadian* that A. Richards, like myself, has trouble with the dendrobium beetle.

It has been my observation over many years that this insect appears to be of a gregarious nature, liking to feed together in groups, frequently decimating a flower or a new growth, while leaving an adjacent one untouched.

As for this pest being selective towards an individual plant, I cannot vouch for that, but I do know they will make short work of the new growth of *Dendrobium X delicatum* if no protection is given to the plant.

I find a fortnightly spraying with "Malathion 50" will keep the beetles at bay, or, if something less toxic is preferred, a weekly spraying with Paterson's "Clensel" may help.

DON BARNHAM
1 Belmore Road
30th January, 1979 — PEAKHURST, N.S.W. 2210

PRONUNCIATION OF BOTANICAL NAMES

Dear Sir,

I was most interested in the President's introduction in *The Orchadian* for March to the membership badge. In particular the paragraph giving the correct pronunciation of *Thelymitra ixioides.*

I find pronunciation a problem as we live in a small country town and have little contact with others with the same interest in the native flora. There could be other members in a similar situation.

I would like to suggest that short articles be included in some future issues of *The Orchadian* giving the correct pronunciation of the names of various native orchids. For example, I am quite at a loss when it comes to the name of a species ending in 'ii' *(Chiloglottis gunnii).*

My wife joins me in saying that we look forward with great interest to each issue of *The Orchadian.*

Yours sincerely,
K.W. BLACK
37 Nicol Street
26th April, 1979 — YARRAM, Victoria 3971

Reply from Dr. Peter Valder:

To be dogmatic about the pronunciation of botanical latin is rather unwise. First of all, Latin isn't spoken these days and so few people are Latin scholars that to expect them to pronounce words as a Latin scholar might, is unrealistic. Also, a French person pronouncing a Latin word will sound quite different to an Australian pronouncing the same word. Then, many botanical names, though of Latin form, are not words known to the Romans. *Chiloglottis,* for instance, is a word compounded of two Greek words, meaning "beautiful tongue", and *gunnii* is derived from an English surname. On the whole it is best to assume the words are English, tempering pronunciation with some recognition of Latin usage. For example, Mr Gunn's name latinized would be *gunnius (gunn-ee-us)* and the genetive of Mr Gunn becomes *gunnii (gunn-ee-eye).* It is a mistake, therefore, to say "gunn-eye" when there are two i's. If it had been Mrs Gunn, she would have been *gunnia,* and the genetive *gunniae* would have been used. As it happens, rightly or wrongly, most people pronounce this the same way as *gunnii.* In short, it is wise not to be too pedantic. After all, if foreign words are used often enough, they become English, as has happened to Paris.

P.G. VALDER
Senior Lecturer
School of Biological Sciences,
UNIVERSITY OF SYDNEY, N.S.W. 2006

(We may publish some longer articles on pronunciation of botanical names in future issues of *The Orchadian* — Ed.)

JERVIS BAY NATURE RESERVE
— A CALL FOR HELP

Dear Sir,

Being a member of A.N.O.S., I find I am getting interested in a venture down here, the Jervis Bay Nature Reserve, a reserve for Australian native fauna. I went to see Mr Fred How, who is in charge of the reserve and he took me for a small walk to see whether the trails are suitable for the establishment of Australian native orchid species. After walking 5 miles down hills and up dales and across various creeks, I was quite impressed by the area. The object of this "orchid walk" at Caves Beach is that quite a few tourists go through this park each year and he wants to improve it for the better. I would like to make a request to other members through *The Orchadian* for plants of Australian native orchid species, suited to this area. These plants will not be pinched or damaged by vandals, as the place is locked up at 4 p.m. in the evening and noone can get in. It is on the banks of a reservoir of water with a capacity of about 2,000,000 gallons and some of the creek banks have sphagnum moss. Plants could be sent to BOMADERY RAILWAY STATION, care of myself, and I will take them to the reserve.

Cymbidium suave, Liparis reflexa and any hardy, cool growing *Dendrobium* and *Sarcochilus* species would survive and flourish there. Please send any letters requesting information to the address below.

Hoping you will heed this call,

I am Yours Truly,
A. RICHARDS
16 Jervis Street
9th April, 1979 — HUSKISSON, N.S.W. 2540

REVISION OF ORCHIDS OF THE WEST

At the invitation of Rita Erickson, a revision of her book "Orchids of the West" is under way at the Western Australian Herbarium. The work was first published in 1951 and a second edition appeared in 1965. It is still available but is now incomplete due to the advance in knowledge of the past 15 years. There have been many name changes, distributions are better known, and there are many new species and varieties to be described and included. The Kimberley orchids will be included for the first time. All descriptions are being revised.

Many people are assisting with the revision. The W.A. Native Orchid Study and Conservation Group especially is helping in a number of ways. Members are adding to the data on distribution, flowering times and habitat, and are collecting specimens of some species that are poorly represented in herbarium collections. A survey of common names has been made. Several members have visited the Herbarium to assist with mounting and labelling specimens.

The work has been greatly advanced through a grant from the Australian Orchid Foundation. With this Ms. Linda Penny was employed to assist in the revisions of descriptions. In the time available she covered more than 50 species, about one third of these found in the State.

A chapter on the pollination of W.A. orchids has been written by Dr. Warren Stoutamire of the University of Acron, Ohio. Dr. Stoutamire has spent several seasons in the South West, studying especially the occurrence of pseudocopulation as a method of pollination in the orchids.

The work is progressing steadily and should be completed in the first half of 1980. The new species and varieties will be formally described in a prior paper. Even at this stage, however, it is clear that there will still be substantial taxonomic problems to be solved after the revision is completed.

New records of orchids from the Kimberley, Western Australia:

After many years during which there has been much speculation on the probability of further records of orchids in the Kimberley, the number of species recorded in the region has been increased almost overnight from four to ten. At the time of my checklist of West Australian orchids (George 1971), the four species then recorded were *Cymbidium canaliculatum* R.Br., *Dendrobium dicuphum* F. Muell., *Eulophia venosa* (F.Muell.) Reichb.f. ex Beth., and *Nervilia holochila* (F.Muell.) Schlechter. From time to time there have been further sightings (Oliver 1976, George 1976). A photograph of *Geodorum pictum* said to be from Kimbolton Station was shown in 1978 at a meeting of the W.A. Native Orchid Study and Conservation Group, and this may be one of the terrestrials referred to by Ron Oliver. At another meeting was shown a plant of a *Dendrobium* collected by Mr. Ron Heberle near the Durack River. It was considered likely to be *D. canaliculatum* R.Br. but no flowers have been available to confirm this.

In January, 1979, Mr. Joe Smith, a grader driver employed at Mitchell Plateau, caused great excitement by bringing in to the Western Australian Herbarium many interesting plants collected during the wet season on the Mitchell Plateau. Among them were five terrestrial orchids, non of which had positively been recorded for the Kimberley before. Much of the plateau had been burnt in October 1978, and in the period before the grass and other ground flora grew tall and dense the orchids were relatively easy to see.

A botanist from the Herbarium, Mr. Kevin Kenneally, visited the Plateau soon afterwards to take advantage of Joe Smith's presence and guidance. He gathered further data on the orchids and added one more species to those discovered by Joe.

The new records are as follows:

Calochilus ? holtzei F.Muell., found in shallow soil over laterite, in low woodland of *Eucalyptus latifolia* near a swamp. Collected 10 Jan. 1979 (in full flower) by J. Smith; and 5 Feb. 1979 (past flowering) by K.F. Kenneally, no. 7018. The specimens are tall and robust, with lanceolate leaves. The species has been recorded from Darwin (N.T.) and the McIlwraith Ra. (Qld.) (Dockrill 1969).

Calochilus sp., found in fine grey silt, seasonally inundated, under *Eucalyptus apodophylla*. Collected 9 Feb. 1979 (in old fruit) by K.F. Kenneally, no. 7100. Although well past flowering, the dried perianth had persisted. The species has a labellum similar to that of *C. holtzei* but the plants are small and slender. It is possibly an undescribed species.

Dipodium punctatum (J.E.Sm.) R.Br., found in laterite, associated with rotting wood, *Eucalyptus-Livistona* woodland. Collected 10 Dec. 1978 (in flower) by J. Smith. Common from north Queensland to Tasmania and South Australia, the species has not been recorded for the Northern Territory, so this collection represents a wide disjunction.

Geodorum pictum (R.Br.) Lindl., found in basaltic black soil in heavy shade of vine thicket near water. Collected 7 Jan. 1979 (in flower) by J. Smith, and 3 Feb. 1979 (in fruit) by K.F. Kenneally, no. 6982. This species also is unknown in the Northern Territory but occurs from north-eastern New South Wales to Cape York and New Guinea.

Habenaria elongata R.Br. found among basaltic rocks under *Terminalia* and in laterite in *Eucalyptus-Livistona* woodland. Collected 17 Jan. 1979 (in flower) by J. Smith, and 7 Feb. 1979 (in late flower) by K.F. Kenneally, no. 7071. This species is apparently rare, only a few collections being known from the Northern Territory and Queensland. The Kimberley specimens are not quite typical, in that the lateral lobes of the labellum are of equal length.

Habenaria ferdinandii Schlechter, found in black alluvial soil and in open areas near a swamp. Collected 15 Jan. 1979 (in flower) by J. Smith, and 3 Feb. 1979 (in late flower) by K.F. Kenneally, no. 6988. The species is common across tropical Australia. Dockrill (1969) recorded it from "north western Western Australia" but no specimens have been traced. The Mitchell Plateau specimens include two variants, one with the lateral lobes of the labellum narrow, the other broad.

Annotated specimens are lodged in the Western Australian Herbarium (Perth).

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A.S. GEORGE
WESTERN AUSTRALIAN HERBARIUM

WINTER CULTURAL NOTES – 1979

Dear Orchadians,

I hope this note finds you and your plants going into the winter in good shape; once the shortest day has gone the days will soon lengthen out and point the way to the oncoming spring.

As far as my area is concerned, this autumn just gone must surely have been one of the most wonderful, weatherwise, that I can ever remember, with day after day of Indian Summer. This is the first season in my memory where a lot of the native dendrobiums have grown three crops of canes, normally I think I am doing well to get two crops. The main offenders have been *D. kingianum, D. ruppianum* and *D. X delicatum*. I hope it is not their final fling and their way of telling me they are going to "snuff it".

This would be rather poor sportsmanship on their part, as after all these months we have just finished rebuilding our orchid house from the mess left of the old one by the great flood of March last year. The structure looks quite impressive, with a high roof and benches that may be raised in a hurry if the need arises again. The orchids seem to be enjoying their new home very much, but the proof of the pudding will be in next Spring's flowering.

What with rehabilitating a farm and getting a business going again I am afraid my orchids had more periods of neglect, in this season just gone by, than ever before, and as I have always stressed regular attention in my notes, I am even more certain now that this regularity is the name of the game in this orchid hobby. Through neglecting a regular spraying programme last summer I had an outbreak of red spider in one corner of my kingianum collection, and even though they were easily eradicated, I have that patch of damaged leaves to remind me of my neglect for the next couple of years. Even though these red spiders have all given the game away till things get warmer again, I had to mention them as I feel that they are just about the biggest single pest that any orchid grower has to face.

These are closely followed by slugs and snails. Unlike red spider, these fellows munch all the year round, wet or dry and hot or cold. Baysol (R) and Defender (R) still seem about as good as one can get, and if used regularly will do a good job for you. The good old fashioned search by torchlight is still my favourite, and will nearly always reveal that odd whopper that doesn't seem to realize that he is supposed to eat those pellets and not the plants. This night search may also reveal other pests that you never knew were in your bushhouse. Slaters and cockroaches are two that come to mind that can do a lot of damage if not controlled. Slaters in particular are hard to combat and I suggest you contact your local nurseryman or Department of Agriculture. I have never had them in my area and I don't like giving advice on anything that I have not treated myself, but I have seen collections quite badly damaged by these same slaters.

Be on your guard against aphids as these little beauties have a habit of popping up at any time at all if conditions suit them, and are they adept at deforming the flower spikes that will be appearing shortly! In a few days they can ruin a year's work if not attended to. A puff of Topclip (R) will soon send them on their way. This Topclip is a very handy weapon against most grubs and insects. Being in dry powder form, it will not hurt your plants in bud or flower unless used to huge excess.

Most natives are fairly dormant at this time, and to feed them would be just plain waste, but have a good look at your collection and take note of anything that is showing root growth and feed these. Most of the Sarcochilus are in full growth now and will appreciate a feed of anything a bit on the weak side.

This feeding of plants is like the breeding of plants: in my opinion we know a lot, but there is still an awful lot that we don't know and I hope you all try to be as observant as possible and if you ever come across any intersting findings, don't be afraid to put pen to paper.

Good growing till next time.

Ted Gregory
R.M.B. 201, Taree, N.S.W. 2130

A letter from
THE AUSTRALIAN ORCHID FOUNDATION

The Foundation would be appreciative if you would bring to the attention of your Members, that the Foundation requires seed of *Australian Orchid Species.*

Although the demand for this seed is limited within Australia, we have found through personal efforts, that there is a demand for this seed overseas. The AOF Orchid Species Seed Bank has been established and is functioning, but has hesitated to let it be known overseas that it is operative, because of the limited quantity and variety of seed available. Therefore, the need for orchid seed should be known to all Orchid Enthusiasts.

The Directors of the Foundation view the function of the Orchid Species Seed Bank as an important segment of the workings of the Foundation.

Apart from Australian Native Orchid Seed, the Seed Bank is also very interested in seed from orchid species from other lands; especially of rare or selected species.

The need for seed will be continuous and should be sent direct to the Curator of the AOF Orchid Species Seed Bank:

Mr L.J. Lawler
Dept. of Biochemistry
University of Sydney
N.S.W. 2006

The information required is: Name of the Species, Name of the Collector and Date of collection.

Any positive assistance your Society can offer the Foundation in this regard will be appreciated.

Yours in conservation,
GERALD McCRAITH

A CHECKLIST OF ORCHIDACEAE IN NORTHERN TERRITORY

by J.T. Simmons

One of the remaining areas in Australia where a concentrated field study of the Orchidaceae remains a challenge is Northern Territory and its associated mainland islands.

Most botanists and naturalists who have contributed to our limited knowledge of the area have operated with the broader objective of complete flora studies rather than individual studies of the Orchidaceae; although Mark Clements of the Canberra Botanic Gardens made a short solo visit to parts of Arnhem Land and Elcho Island in 1978 — principally to do a field study of native orchids. The ecology of Northern Territory is such that most orchids occur in the Darwin and Gulf District, although some occurrences are recorded in both the Victoria River District and the Barkly Tableland.

The former area enjoys a high summer rainfall — in excess of 1600mm in places — due to the influence of the Monsoon between November and April; but in contrast it has a long, dry Winter — often approaching drought conditions. This possibly accounts for the relatively small number of epiphytes found in the area. For example, there are only three *Dendrobium* species recorded to date although an as yet undescribed species is reported from the Cobourg Peninsula. The possible occurrence of *Dendrobium discolor* will become a matter for speculation if its occurrence in the north-west of Western Australia is confirmed.

Terrestrial orchids are widespread and a few are relatively common. Some twenty or more species have been recorded to date and it is probable that this listing will increase with the discovery of further indigenous and possibly endemic species.

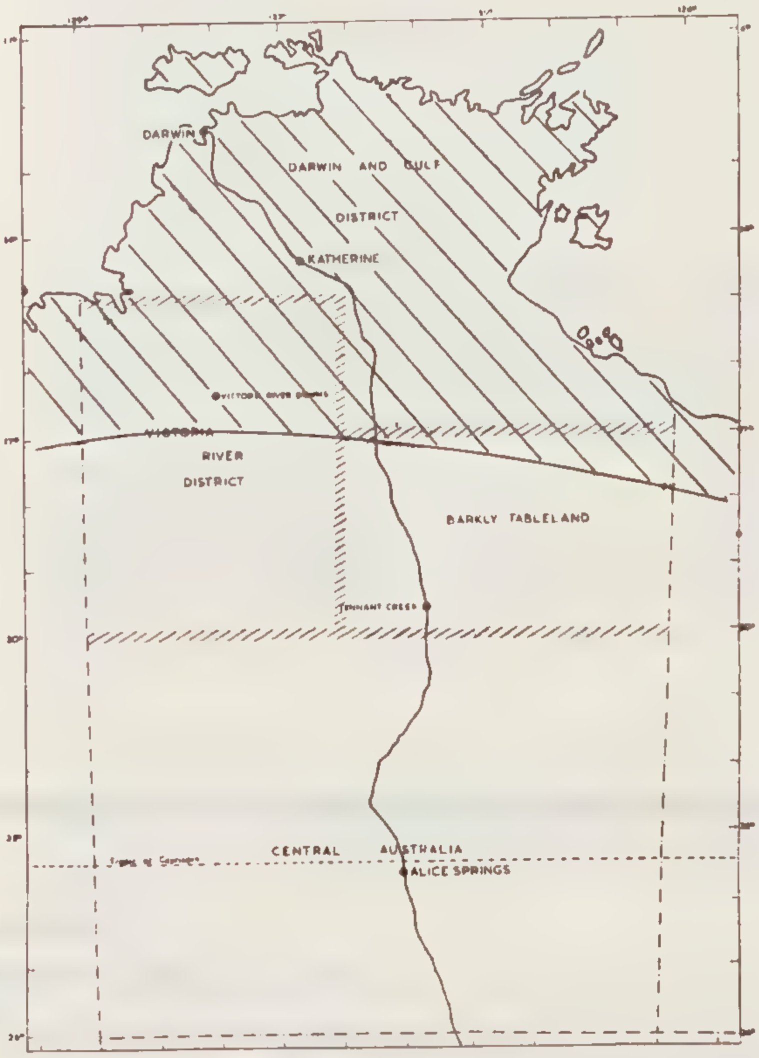
However, for a number of species collection has not been repeated since their original recording, and no satisfactory herbarium specimens are available. This may prompt some future deletions from the Check List. An example is *Dipodium punctatum* where some current botanists doubt its occurrence in Northern Territory. *Dipodium stenocheilum* O. Schwarz has also been deleted from the present listing.

A recent recording of an *Habenaria* sp. may prove to be a variety of *Habenaria elongata* although specimen plants show distinct differences from the type variety described in Dockrill.

The inaccessibility of much of Arnhem Land during the 'Wet' Season, the constraints imposed by ethnic considerations and the high cost of travel to Northern Territory are all limiting factors when considering field study work in the area. However, there is no reason to accept that these are unsurmountable problems and it is expected that our knowledge of the Orchidaceae in Northern Territory will increase considerably during the next few years.

The check list has been compiled from various referenced publications on the subject and also reflects invaluable information, detail and advice contributed by Clyde Dunlop, Curator of the Northern Territory Herbarium, Darwin, and Henning Hintze, Naturalist/Orchid Grower of Darwin.

NORTHERN TERRITORY OF AUSTRALIA



CHECKLIST OF NORTHERN TERRITORY ORCHIDACEAE:

Arthrochilus irritabilis (F. Muell.) Schlechter
Arthrochilus byrnesii D. Blaxell
Calochilus holtzei F. Muell. var. *obligococca*
Chiloschista phyllorhiza (F. Muell.) Schlechter
Cymbidium canaliculatum R.Br.
Dendrobium canaliculatum R.Br. var. *foelschei* (F.Muell.) Rupp and T.E. Hunt
Dendrobium dicuphum F. Muell.
Dendrobium johannis Reichb.f.
Didymoplexis pallens Griff.
Eulophia venosa Reichb.f.
Geodorum densiflorum (Lam.) Schlechter
Habenaria elongata R.Br.
Habenaria ferdinandi Schlechter var. *ferdinandi* var. *arnhemica* (8th) Dockrill
Habenaria holtzei F. Muell.
Habenaria hymenophylla Schlechter
Habenaria ochroleuca R.Br.
Habenaria triplonema Schlechter
Habenaria mesophylla Kranzlin
Habenaria eurystoma Schlechter
Luisia teretifolia Gaud.
Nervilia discolor (Bl.) Schlechter
Nervilia holochila (F. Muell.) Schlechter
Nervilia aragoana Gaud.
Nervilia uniflora (F. Muell.) Schlechter
Pachystoma holtzei (F. Muell.) F. Muell.
Vanda tricolor Lindl.
Dipodium sp. (formerly listed as *Dipodium punctatum* (J.E. Sm.) R.Br.)
Habenaria sp. (this may be a variation of *H. elongata*)

NORTHERN TERRITORY INDIGENOUS ORCHIDS — March, 1979

GENUS AND SPECIES DETAILS — REFERENCES

Arthrochilus irritabilis (F. Muell.) Schlechter
Occurrences reported at Raydon Creek, Mt. Brockman.
(Dockrill, 1969, p. 200; Blaxell, 1972, 1973; Clements, 1978, N.T. Herbarium list, 1979)

Arthrochilus byrnesii D. Blaxell
Occurrences reported at Waterfall Creek, U.D.P. Falls. (No other known locations to date.)
(Blaxell, 1972; N.T. Herbarium list, 1979)

Calochilus holtzei F. Muell. var. *obligococca*
Occurrences reported near Darwin, Jabiru Swamp, Melville Island.
(Dockrill, 1969, p. 80; Clements, 1978; N.T. Herbarium list, 1979)

Chiloschista phyllorhiza (F. Muell.) Schlechter
Occurrences reported at Berry Springs, Woolner, Tortilla Flats and generally the Mary River Swamp System. Epiphytic in habit and generally host is Fresh Water Mangroves.
(Dockrill, 1969, p. 708; Clements, 1978; N.T. Herbarium list, 1979)

Cymbidium canaliculatum R.Br.
Widespread distribution but grows almost exclusively with 'Snappy Gums' (bloodwood eucalypts) as host. There is a wide variety of colour forms — yellow flowers with brown speckles — brown with yellow edges and a pure yellow form from around Katherine.
(Dockrill, 1969, p. 630; Chippendale, 1971, p. 228, Clements, 1978; N.T. Herbarium list, 1979)

Dendrobium canaliculatum R.Br. var. *foelschei*
Widespread distribution around paperbark swamps with *melaleuca* species as host. Wide variety of colour forms. Flowers white with green/yellow, or grey, or mauve or mushroom petal tips. Yellow with brown petal tips.
(Dockrill, 1969, p. 460; Chippendale, 1971, p. 228, Clements, 1978, N.T. Herbarium list, 1979)

Dendrobium dicuphum F. Muell.
Widespread distribution overhanging water at lagoons, also Melville Island, Bathurst Island, Groote Eylandt, Cobourg Peninsula, etc. A variety of host trees but commonly found on *Cycas armstrongii* and *Vitex glabrata.* Varieties range from pure white flowers to white with black/purple centre.
(Dockrill, 1969, p. 444; Chippendale, 1971, p. 228; Clements, 1978; N.T. Herbarium list, 1979)

Dendrobium johannis Reichb.f.
Occurence in Coastal Areas, Cobourg Peninsula, Melville and Bathurst Islands. A pure yellow colour form found on Melville Island and a yellow/brown form from Bathurst Island.
(Dockrill, 1969, p. 472; Chippendale, 1971, p. 228; N.T. Herbarium list, 1979)

Didymoplexis pallens Griff.
Reported to have been collected in N.T. but no specimens are cited.
(Dockrill, 1969, p. 218; Lavarack, 1977, 1978)

Dipodium stenocheilum O. Schwarz
Some confusion over the occurrence of this species and it probably should be suppressed.

(cont'd. next column)

N.B.: Not on A.O.F. List of Australian Indigenous Orchids or in Dockrill, except as a suppressed variety of *Dipodium punctatum.*
(Chippendale, 1971, p. 228; N.T. Herbarium list, 1979)

Eulophia venosa Reichb.f.
Occurrence reported from Mt. Greenwood.
(Dockrill, 1969, p. 600; Chippendale, 1971, p. 228; N.T. Herbarium list, 1979)

Geodorum densiflorum (Lam.) Schlechter
Rather widespread occurrence including Berry Springs, South Alligator Crossing, Elcho Island.
(Dockrill, 1969, p. 608, Chippendale, 1971, p. 228; Lavarack, 1976; Clements, 1978; N.T. Herbarium list, 1979)

Habenaria elongata R.Br.
Believed to be rather widespread in Arnhem Land.
(Dockrill, 1969, p. 48; Chippendale, 1971; N.T. Herbarium list, 1979)

Habenaria ferdinandi Schlechter var. *ferdinandi*
var. *arnhemica* (Bth.) Dockrill
Both varieties occur in Arnhem Land and var. *arnhemica* is probably endemic. Also reported from Elcho Island.
(Dockrill, 1969, p. 42; Chippendale, 1971, p. 228; Clements, 1978; N.T. Herbarium list, 1979)

Habenaria holtzei F. Muell.
Reported from near Darwin.
(Dockrill, 1969, p. 26; Chippendale, 1971; N.T. Herbarium list, 1979)

Habenaria hymenophylla Schlechter
Known to occur in areas near Darwin, Cobourg Peninsula, Rum Jungle and Elcho Island.
(Dockrill, 1969, p. 28; Chippendale, 1971, p. 228; Clements, 1978; N.T. Herbarium list, 1979)

Habenaria ochroleuca R.Br.
Reported from near Darwin, Newcastle Ranges Area, Georgetown billabong near Jabiru.
(Dockrill, 1969, p. 38; Chippendale, 1971, p. 228; N.T. Herbarium list, 1979)

Habenaria triplonema Schlechter
Reported occurrences near Darwin and also at Elcho Island.
(Dockrill, 1969, p. 46; Clements, 1978)

Habenaria mesophylla Kranzlin
Knowledge of location limited to Northern Territory.
(Dockrill, 1969, p. 18)

Habenaria eurystoma Schlechter
Reported from near Darwin and near Timber Creek.
(Dockrill, 1969, p. 40)

Luisia teretifolia Gaud.
Recorded near the Howard River Area.
(Dockrill, 1969, p. 674; Chippendale, 1971, p. 228; N.T. Herbarium list, 1979)

Nervilia discolor (Bl.) Schlechter
Recorded in the Green Ant Creek Area.
(Dockrill, 1969, p. 188; Chippendale, 1971, p. 266; Clements, 1978; N.T. Herbarium list, 1979)

Nervilia holochila (F. Muell.) Schlechter
Recordings have been made at Obiri Rock, East Alligator River, Cannon Hill, Nourlangie Rock, Mt. Bundey, Moline and Elcho Island.
(Dockrill, 1969, p. 190; Chippendale, 1971; Clements, 1978; N.T. Herbarium list, 1979)

Nervilia aragoana Gaud.
Recorded near Darwin and Arnhem Land.
(Dockrill, 1969, p. 192)

Nervilia uniflora (F. Muell.) Schlechter
Reported near Darwin and in Arnhem Land, also at Green Ant Creek.
(Dockrill, 1969, p. 192)

Pachystoma holtzei (F. Muell.) F. Muell.
Recorded near Darwin.
(Dockrill, 1969, p. 238; Chippendale, 1971, p. 228; N.T. Herbarium list, 1979)

Vanda tricolor Lindl.
Has been recorded in Arnhem Land but regarded as rare. Apparently found on *Pandanus* sp.
(Dockrill, 1969, p. 678; N.T. Herbarium list, 1979)

Dipodium sp. (formerly listed as *Dipodium punctatum* (J.E.Sm.) R.Br.)
This species remains to be correctly identified. Doubt regarding the occurrence in N.T. of *Dipodium punctatum* has been expressed.
(Dockrill, 1969, p. 624; N.T. Herbarium list, 1979)

Habenaria sp.
A species found in 1977 at Huondot — near Bachelor may prove to be a variation of *H. elongata.* Specimen is much larger than *H. elongata* and does not have lateral lobes which are asymmetric, as described for *H. elongata.*
(Dockrill, 1969, p. 48)

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Clements, M.A. (1978)	Report on Field Trip to Elcho Island and Northern Territory. Canberra Botanic Gardens, Canberra, A.C.T.
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4 Gothic Avenue
STONYFELL, S.A. 5066

March, 1979

FEEDBACK AND FOLLOW-UP

- R.D. Fitzgerald's *Australian Orchids, Volume 2:* At the end of May the publishers (Lansdowne Editions) informed us that the fascimile reprint of Volume 2 had been completed and distribution to advance subscribers would begin in August this year, as copies come from the binder. Unfortunately publicity brochures were not yet ready. Readers may assume the same price and discount we had for Vol. 1.

- A Reprint of Volume 1 of *Orchadian*?
Volume 1 of *The Orchadian* is now out of print for the second time. In view of continuing demand for "all back issues", ANOS Council will consider reprinting in the light of expressions of interest from existing subscribers and new members.

Council realises that very many recent new members have been supplied with all back issues, except Volume 1. However, as no record has been kept of these requests it would be appreciated if those who have been disappointed would now renew their requests in order to assist us in estimating the number of reprints required.

It will be appreciated that the reprinting will not be justified unless the number of orders is sufficient to bring the cost down to about $10 per copy.

In view of the unusual format of the original Volume 1 (foolscap size), it is felt that many readers, who have a bound copy, may wish to order a new one if it is reproduced in quarto size to match that of Vol.'s 2 — 5. Please let us know if you are interested in this possibility.

Expressions of interest might please be marked *"Reprint of Orchadian Volume 1"* and addressed to the Secretary, ANOS, P.O. Box C106, Clarence Street, Sydney 2000, as soon as possible. We hope to be able to announce a decision in the September or December issue, 1979.

- It was mentioned in *The Orchadian* of December, 1978, that ANOS Sydney Group plans to establish an orchid garden at Taronga Zoological Park, Sydney. A plan of the proposed area is included in the June issue of "The Orchidophile" (ANOS Sydney Group Bulletin) and work will soon be underway. Native orchid plants are now required for this project. Would readers, who know of suitable plants available in quantity, please contact the Secretary of ANOS?

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AUSTRALIAN ORCHID FOUNDATION ORCHID WORKSHOP

An A.O.F. Orchid Workshop is to be held at the Burnley Horticultural College, Melbourne on Sunday, 12th August, 1979. A similar, A.O.F. sponsored workshop, held last August at the Hawkesbury Agricultural College in Sydney, was a resounding success. Information may be obtained by writing to The Australian Orchid Foundation, c/- 107 Roberts Street, Essendon, Victoria 3040.

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"Alba" form of *Cymbidium canaliculatum*

A notice was included in Native Orchid News (Darling Downs Group) of April, 1979 stating that an "alba" form of *Cymbidium canaliculatum* is to be mericloned in the very near future. This plant (or form?) is illustrated as fig. F, plate 447 in "Orchids of Australia" by W.H. Nicholls. It is not clear whether these mericlones would be made available to people outside the group, but "interested parties could secure their plants by contacting Dr N. Grundon, 4 Jean Street, Toowoomba, Qld. 4350".

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SOME THOUGHTS ON *Sarcochilus hillii* (F.Muell.) F.Muell.

by Ted Gregory

I remember being out with a farmer friend in a patch of light scrub that was laced with *Sarcochilus hillii,* and upon being shown a plant, he said that he had never seen that orchid before, even though he had known that patch of scrub for years. I wonder how many people have walked past this little gem of the bush and have not even seen it?

Sarcochilus hillii must surely be one of the freest flowering of all the Sarcochilus that grow in this part of the world and must have one of the longest flowering periods of any of our local orchids, with it's habit of opening one or two flowers a day on a raceme that may have as many as twenty buds on it. And on top of all this, these fabulous little crystalline gems will each last for days in their own right. These flowers will vary from plant to plant (as will any orchid) in size, shape and colour.

The average size of the flowers would be around about a quarter of an inch, some below this, but most just a bit above. They vary amazingly in shape from a wide, open form like a miniature *S. olivaceus* to perfectly rounded and cup-shaped forms for all the world like tiny *S. falcatus.* In colour, they range from just off pure white to a fairly strong pink, with light pink perhaps being the most common shade. And every one has that beautiful iridescence that can catch the light from any angle and turn the floret into a living jewel.

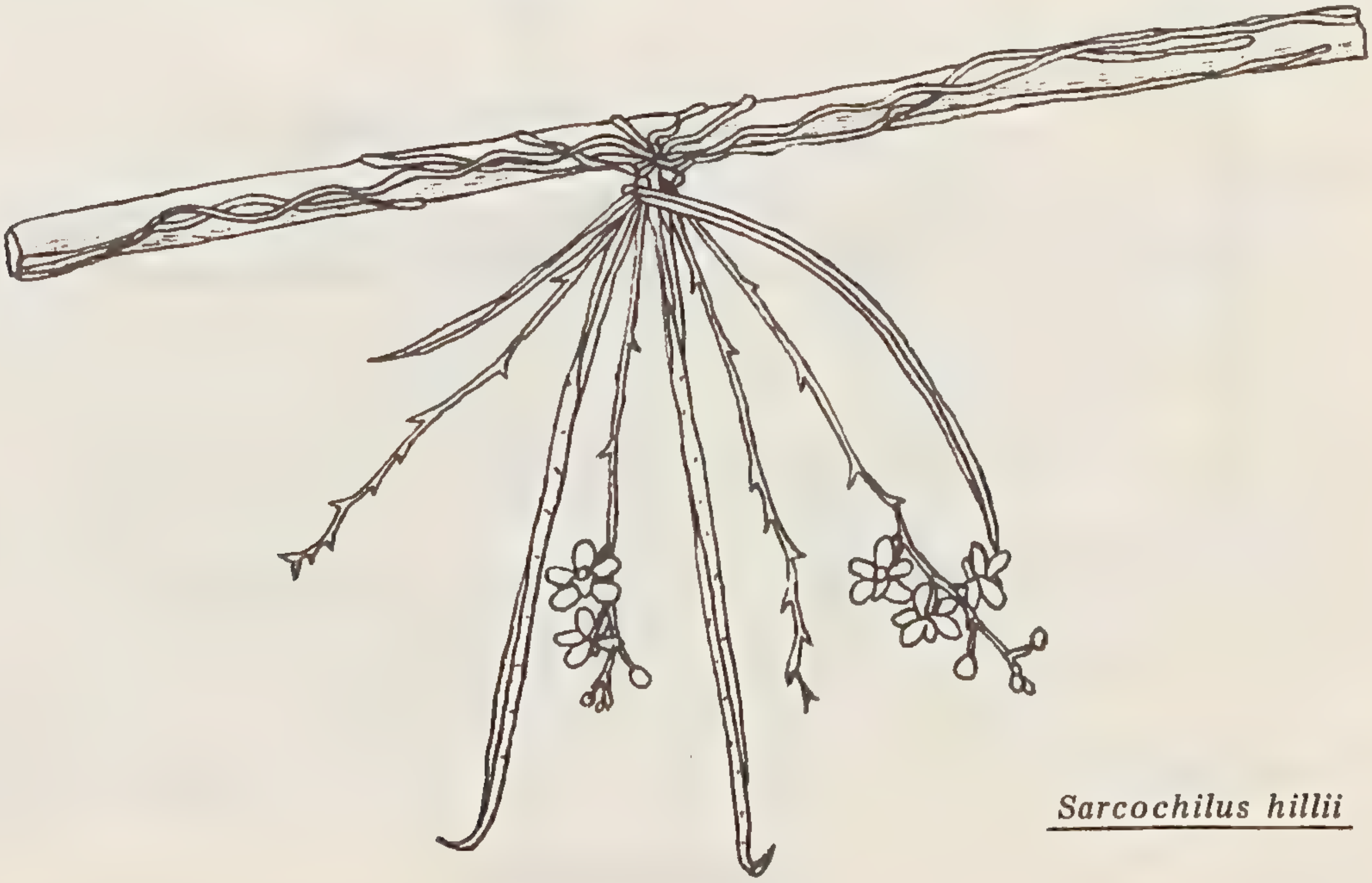
S. hillii is quite common in the Manning River area, that is anywhere that man has left it a habitat in this area. It is an orchid that may be found more or less anywhere in the brushes, but shows a fairly definite preference for that strip of light scrub that normally occurs on the top side of a brush before it runs out into open forest. In untouched areas it is common right down to wallaby-chewing height, and not many orchids survive below this. As it likes this strip on the edges of the brush it is one of the orchids most affected by the introduced *latana.* The water run-off from *latana* must be very acid, as no orchid will live in such a situation for long. Also, bushfires give this strip the very devil as well, so as you can see, our little friends have their share of troubles.

The plant itself of *S. hillii* is hard to spot, even for the expert, except when in flower, and then of course the flowers make it stand out much more. The plants are normally quite small, quite often only comprising of half a dozen of those little grey-green pendulous and semi-terete leaves that may be between an inch and a half and four inches long. Without flowers on the plant it can be easily overlooked as a piece of fungus growing on the side of a tree. Occasionally one will come upon much older plants that have "keikied" and grown into quite large clusters: I find these large plants are harder to transplant than the small ones and are best left in the bush to spread their seed.

S. hillii is an easy orchid to adapt to bushhouse conditions and will grow like a weed if a bit of thought is given to making its new environment; and the best way to do this, if possible, is to have a look at its old habitat. Here you will see that it grows mainly on the trunks of small brush trees or in the heads of these. They are growing in more or less full shade and with good cool air movement. If you have a plant that is attached to a twig, leave it there and just hang it in your bushhouse in the shady corner four or five feet off the ground if possible. Around eye level seems to suit it and is the best height to enjoy the plant as well. if your plant is detached and bare rooted for a start, cut off all damaged roots and then dunk it in a mixture of Fieldpak or Formula 20 and fungicide for a minute or two, then tie it gently on to a piece of ti-tree with panty-hose. Another thing that *S. hillii* will grow well on is a piece of those big lianas or monkey vines that grow in brushes; these will last for years in the average orchid house. If you live in an area where your orchid house gets hot in summer, it will help if you have your plant facing south, away from the sun. This same wrinkle will save many a *S. falcatus* plant, too. It's marvellous the difference from one side of a stick to another can make to a plant at a critical time.

This orchid fits in well with the other Sarcochilus in that it likes a bit of feed all the year round and unlike other members of this genus, it is not particular about when it is transplanted.

R.M.B. 201
TAREE, N.S.W. 2430



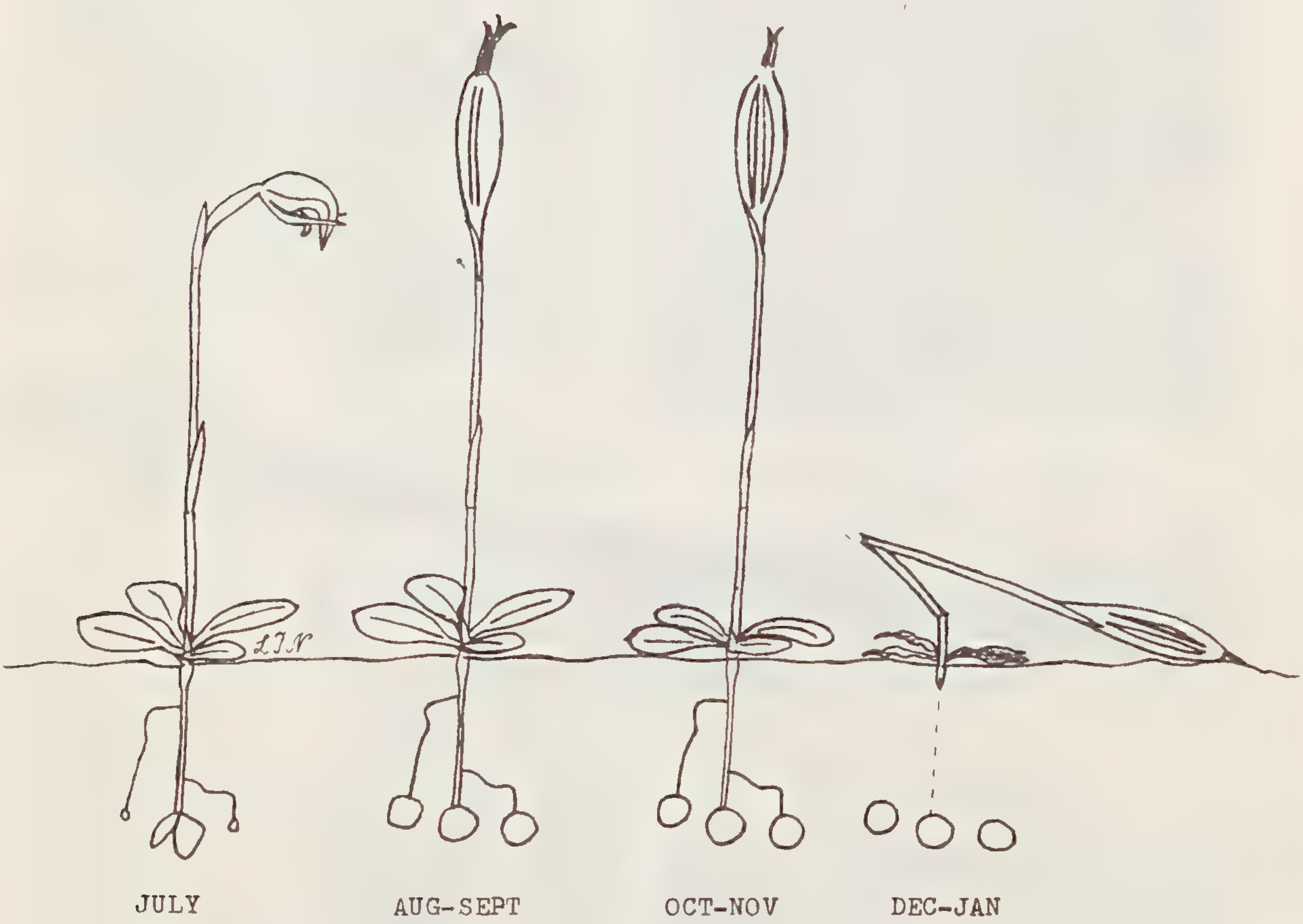
Sarcochilus hillii

TERRESTRIAL CULTURE NOTES

L.T. Nesbitt

Opening rains in April of 40mm (1½") on two occasions a week apart ensured a good start to the 1979 growing season. Plants popped up within a fortnight in most of the pots not already showing plants. From this point on the low evaporation rates of winter ensure that my pots, with their 40% peat moss content do not dry out again until Spring. Hand watering in a shadehouse is usually not necessary before the end of August in these parts. Nearly all pterostylis species were up by the end of April with the exception of *P. cucullata* which always delays emergence until late May or June. By the end of May the bare pots of Summer were full of green leaves and the early Autumn flowers of *Eriochilus cucullatus* and *Pterostylis revoluta* had faded.

Corybas species are among the last to appear and few leaves are visible at the beginning of June. The leaf develops underground, rolled up like a scroll. The rolled leaf pushes up to the light, end on, and unrolls on to the soil surface exposing a partly developed bud. Growth is rapid and the single flower is open within 6 weeks of the first sign of



Pterostylis nutans

the leaf. Some corybas species are shy flowering and less than 5% of plants flower. *Corybas dilatatus,* our most common helmet orchid in South Australia is free flowering in Adelaide. It has a comparatively large, dark red flower, up to 15mm in diameter, which is beautifully veined and frilled. The flower is formed from the dorsal sepal and large labellum. The petals and ventral sepals are insignificant and barely visible while the column is hidden within the flower.

Corybas species prefer very shady humid conditions at flowering time; in fact they can be watered daily in mid-Winter, a practice which will quickly kill the roots on most cultivated orchids. Corybas buds and flowers will dessicate in a dry atmosphere. This can be prevented by placing an inverted glass over the plant or by enclosing the pot in a plastic bag. I grow my corybas in the shadiest corner of the shadehouse where they get no direct sun in Winter but every drop of rain can reach them. By mid-August flowering is complete and the plants should be given good air movement to prevent leaf rot. In Spring they can tolerate, and seem to prefer, brighter conditions for tuber development. Corybas, in common with chiloglottis, have the ability to elongate the flower stem after fertilization. Seed pods can be elevated as much as 225mm (9") to aid seed dispersal. Corybas are sensitive to fluctuations in soil moisture content during the growing season. I use large pots 7 – 12" diameter and a high proportion of peat moss (up to 50%) in the soil to minimise these fluctuations.

Caladenia species all appear at the same time in early May in my collection. Weak plants and small seedlings follow a week or two behind the more robust specimens. By late June all deciduous terrestrial species are up and you can take stock and decide whether your Summer treatment was satisfactory or not. If your plants have not come up, wait until the end of July before knocking out the pot to see if the tubers dried up in Summer (starchy lumps) or rotted in Spring or Autumn (no trace at all). Modify your culture accordingly.

Weeds can be a menace in early Winter and should be carefully removed as soon as you can determine that they are not orchids. Resist the temptation to pull up every strange leaf as it could be a seedling Diuris or Thelymitra. Seedlings begin to appear around adult plants in my collection about the middle of July. Tiny green leaves about 2mm high are always a welcome sight especially in pots of a rare Caladenia. Additional seedling leaves continue to appear until Summer. The observant grower will be looking for small white protocorms between the pine needles even before seedling leaves are visible. Don't disturb the needle topping in your eagerness to find something or you will destroy the delicate protocorms. Extra chopped pine needles should be added if rain is causing erosion of the surface. I find that in Winter conditions of constant dampness the needle topping is soon bound together into a solid mass by fungus threads and growths of native mosses.

Specimen pots of the colony type orchids, mostly Greenhoods, come to full bloom from the end of June until mid-September and help to brighten the cold, dull Winter days of southern Australia. They meet little opposition from epiphytes at the Winter shows and reign supreme for about two months. *Pterostylis scabra var. robusta* in June followed by *P. nana* and *P. nutans* in July are commonly seen in massed displays here. *P. curta* and *P. pedunculata* follow in August and early September. A range of easily grown Pterostylis will provide flowers from April to November. There are about 70 species to choose from. Unfortunately many species are not yet easy to obtain even from specialist growers, so building a collection is a lot of fun. Their ease of culture and reliable flowering plus a variety of plant forms and flower shapes provide a fascination which brightens the otherwise drab Winters in these parts. Pterostylis deserve to be more widely grown and displayed. Perhaps one day they will be grown for cut flowers?

A constant watch for wogs and bugs must be maintained if your plants are to be seen at their best. I bait the shadehouse floor for slugs and snails and spray for aphis and grubs at the first sign of infestation. The best insurance is regular visits at midnight with a torch to pick off offending marauders before they can fill their stomachs on your favourite blooms.

18 Cambridge Street
VALE PARK, S.A. 5081

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HOW I GROW SARCOCHILUS FITZGERALDII

by Michael Derham

(Reprinted from the ANOS Victorian Group Bulletin of May, 1978)

(Michael was awarded a Cultural Certificate for his specimen plant of this species.)

Sarcochilus fitzgeraldii is one of the prettiest of our lithophytic orchids and in its habitat usually grows on moist rocks in ravines, where it is kept moist by the spray from waterfalls. It grows in large colonies of hundreds of plants in fairly heavy shade provided by over-hanging vegetation.

Although *Sarcochilus fitzgeraldii* grows quite well in plastic or terra-cotta pots in an *open mix* of charcoal, bark and tree fern, I find that *to obtain a specimen plant it is preferable to grow it on tree fern.*

From a piece of tree fern, say 9" – 10" in diameter and 15" long, cut lengthwise and then cut out the core and soak in lime water for one week. After soaking, rinse the tree fern, fill the hollow with charcoal, bark and a little limestone, plant 7 – 8 pieces all of the one clone around the edges of the tree fern and the plant will soon cover the entire log.

The roots will be both in the tree fern log and in the air and it is important to allow the plant ample ventilation if grown in a glass-house and fairly heavy shade. I normally hang my plants by an open louvre window.

Fertilise once every 2 – 3 weeks with a very weak solution of fish emulsion or Aquasol.

In the main growing season – November through to April – a specimen plant will reward a grower with hundreds of delightful white/pink blotched flowers.

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NOTES FROM BONALBO

by Peter Vaughan

(Reprinted from NATIVE ORCHID NEWS (Darling Downs Group) of May, 1979)

I am writing this, not as a field report, but as a collection of observations made on a field trip.

We were an active and optimistic crowd as we entered the bush ready to take on all the stinging trees and leeches that Bonalbo had to offer. In our steady organised collecting (perhaps more reminiscent of a shark's feeding frenzy) we collectively stripped each tree of its orchids (some say we put plague locusts to shame). I only hope our enthusiasm was maintained till we got home and had all the plants mounted on new hosts.

Perhaps a few will take this as a reminder to finish mounting the last couple. In the rush though I feel all of us overlooked important points which could be valuable to us in the cultivation and further collection of these species. Before I give the most valuable information, I will describe the situation:

We arrived in a light rain forest that had been selectively logged in the past. Added to this disturbance is exposure to regular storms and occasional cyclones which are significant as few trees were over 3ft. in diameter and the disturbance would probably be the main factor preventing a dense rainforest forming. More striking than the orchids and ferns present were those absent. *Platycerium superbum* was everywhere, but *P. bifercatum* was missing, a phenomenum that I have never seen before and can't account for in any way as the latter grows over a much wider range of conditions.

Of the orchids, not one specimen of any *Cymbidium* species was found. *Bulbophyllum bracteatum* was present but not *B. exiguum* or *B. crassulifolium.* Only one specimen of *Dendrobium beckleri* was found and not one other terete leaf dendrobe. Three to four plants of *D. tetragonum* were found and *D. schneiderae, D. gracilicaule* and *D. speciosum* were common.

Of the "sarcs", *S. falcatus* was common, *P. tridentata* was uncommon and *R. divitiflora* was represented by only a few specimens. I would have expected to find at least one of the diminutive three, *Papillilabium beckleri, Schistotylus purpuratus* or *Sarcochilus hillii.* Our one excellent find was *B. minutissimum,* the first four discoveries being small and requiring hard searching (actually two were accidental). The fifth kind of hid the tree under the biomass of tiny pseudobulbs; even Bill Bennett was able to see it in spite of leaving his glasses in his car in Toowoomba.

Anyway, I made the following interesting observations with Doug Binns: At least 90% (and perhaps 98%) of the orchids were on three tree species, in spite of two being represented by only one individual each. Other, apparently similar trees with mossy branches, had no orchids. The trees, with brief notes to aid identification, are listed below.

Araucaria cunninghamii (hoop pine):
Unfortunately, this species is usually dragged away completely on felling but one remained and was very rich in all orchids and ferns.

Flindersia australis (teak or crow's ash):
This species is easily recognised by its smooth grey-yellow bark that slowly loses spots 4 – 6 inches across. It has a stickly fruit 3 – 4 inches long and the leaves are pinnate with translucent dots. This tree was literally covered with *B. minutissimum* and when I left at 1 p.m., Doug Binns still thought that he was dreaming all those little pseudobulbs and that so many could'nt really exist on one tree.

Heritiera actionphylla (booyong or bush tulip oak):
This is a relatively common tree and an exceptional host to all orchids (including *B. minutissimum*) and ferns. On returning to the area I would concentrate on this tree as it is easily identified with practice. The bark is segmented, light in colour and the leaves are composed of 5 – 9 leaflets and are very similar to those of the umbrella tree. The base of the trunk is often buttressed.

We noticed that *D. schneiderae* and *B. bracteatum* always preferred the under, mossy side of the branches. *B. minutissimum* was growing on all sides of branches over 5 inches in diameter, but on 4 inch branches (most likely higher and more exposed) it grew only on the underside. It also showed a distinct preference for the smooth bark trees, such as figs and for rock surfaces. This would be a sensible guide in choosing an artificial host.

We probably overlooked many important points, but hopefully readers will add to our observations on future trips and then inform others through the group bulletins or through *The Orchadian.*

Australasian Native Orchid Society
Warringah and Sydney Group's
5th Annual Spring Show

Once again Show time has come around and we are sure the forthcoming Show will be up to the standard of previous years, if not better, because of the later date.

We hope this year to see more entries from other Societies and Groups, especially in the section for displays.

SHOW DETAILS:

MONA VALE COMMUNITY HALL – PITTWATER ROAD & PARK STREET

Friday,	September 14	– Benching only. Noon to 10 p.m.
Saturday,	September 15	– 9 a.m. to 9 p.m.
Sunday,	September 16	– 10 a.m. until Prize Giving at 4 p.m.

ENQUIRIES:

Show Marshall – NORMAN HILLIGER
14 Wangara Street
MONA VALE, N.S.W. 2103
Phone: 99 2468

BOOK REVIEW

"Native Orchids of South Australia" by Eileen Gentry and Pat Foreman. (Our copy from the Native Orchid Society of South Australia, p. 93. Printed by the Castlemaine Mail, 155 Barker Street, Castlemaine, Victoria 3450. Published 1979. Price: $5.50)

There have been a number of books on Australian orchids published in the last decade or so. This is yet another, though it is the first one to be devoted solely to South Australian orchids for over 60 years — that is, since R.S. Roger's "An Introduction to the Study of South Australian Orchids". The authors have justified their publication by stating they feel there is a need for this kind of book — one which is not technical, and where the contents is being kept as simple as possible.

The book itself is rather more limited than its title suggests, containing details of only those orchids with which the authors are familiar — somewhat less than the nominal 124 species and varieties they have listed for the State. Of these, only 32 are illustrated; far too few for a book purporting to aid the layman in identifying South Australia's orchids. The photographic reproductions are also of rather poor quality, and at least one caption appears incorrect. The authors imply they have followed the nomenclature in the 3rd Edition of Part I of Black's "Flora of South Australia" (Jessop, 1978), so there is really no need for inaccuracies such as *Eriochilus cucullata* instead of *E. cucullatus.*

A point well made is the comment that orchids flower less well during a year after good rains have followed a drought — "as they use the good season to re-establish themselves and form new tubers at the expense of producing blooms". It is, however, difficult to reconcile this with the remark for Caladenia that "during times of drought many plants wither and do not complete their growth cycle, but in good years hundreds of flowers can be found". Then in the Introduction the suggestion is made that colour may play an important part in the attraction of insects as potential pollinators, but the role that scent plays is omitted. This is in spite of the emphasis given to this factor in Nicholls' "Orchids of Australia"; one of the prescribed texts for additional information. It is, however, stated in the specific case of *Cryptostylis subulata* that insects are attracted by the smell, and in more general terms that some prasophyllums are strongly perfumed. There is no mention either of another orchid peculiarity: the number and diminutive size of the seeds, and also the processes of germination.

Interpretations are given for translations of some of the generic and specific names but in some cases these are wrong. For instance, 'deformis', in *Caladenia deformis,* refers to the shape of the calli, not the leaf, as stated. Also several of the plant sizes quoted are inaccurate and misleading, but the feature of the book hardest to reconcile is the rarity or otherwise of the various species. It is difficult to see just how these could have been determined, as they seem to bear little relationship to reality. Then again: why is it stated for only *Corybas unguiculatus* and for no other Corybas (or any other relevant species) that the stem elongates after fertilisation? Finally: what evidence do the authors have for their statement that *Dipodium punctatum* is found "growing among trees and shrubs where it can anchor itself on to the root of an eucalyptus tree, which appears to be the commonest host plant"?

It is a private publication, and so presumably mainly a labour of love, but this is no excuse for the numerous errors the book contains. On the whole, it could have been a much better publication if far more effort had been put into ensuring the accuracy of the contents before it went into print. As it stands, it is not a good book, and at $5.50 is decidedly overpriced.

Peter Hornsby
President, N.O.S.S.A.
8, Kingross Avenue
LOWER MITCHAM, S.A. 5062

ANOS Hastings Valley Group — Spring Show and Annual Meeting

This group will hold its Spring Show on MONDAY, 1st OCTOBER (long weekend) at the Uniting Church Hall, Hastings Street, Wauchope.

Show schedules may be obtained by sending a stamped, self-addressed envelope to the Secretary, R.M.B. 60, Pappinbarra Road, BEECHWOOD, N.S.W. 2446.

The Annual Meeting of the Group elected the following office-bearers for 1979:

President:	Kevin Blanch
Vice-President:	Len Livi
Secretary:	Norma Blanch
Assistant Secretary and Publicity:	Marcus Howe
Treasurer:	Robin Cook
Plant Registrar:	Rod Graeme
Librarian:	Margaret Potts

New ANOS Central Coast Group

The first Annual Meeting of this new regional group of ANOS was held on 19th April, 1979 at the home of Mr & Mrs A. Peck, Narara.

The following office-bearers were elected:

President:	Mr Milton Larvan
Vice-President:	Mr Roy Gifford
Secretary:	Mr Ross Worrell
Treasurer:	Mrs J. Worrell

Sixteen enthusiastic members attended the meeting, along with Mr N. Hilliger, of Warringah Group, Sydney. It is planned that guest speakers will talk at each meeting, and that field days will be organised.

Meetings will be held on the second Wednesday of each month at 7.30 p.m. at the Teachers Resources Centre, Georgiana Terrace, Gosford. The Secretary may be contacted by writing to 6177 Oliver Road, LISARO, N.S.W. 2251 or by phoning Gosford 24 4435.

Native Orchid Society of South Australia

The following office-bearers were elected for 1979:

President:	Peter Hornsby
Vice-President:	Jim Simmons
Secretary:	Roy Hargreaves
Treasurer:	Ron Robjohns

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DENDROBIUM MOOREI

by Andrew Garnham

(Reprinted from the A.N.O.S. Victorian Group Bulletin of June, 1979)

Description: — Pseudobulbs 8—20cm high, strongly marked with prominent angles and furrows, usually equally thick throughout, or sometimes attenuate or thickened at the base. Pseudobulbs initially covered by scarious sheathing bracts, later yellow to green in colour and shiny. Leaves 4--6 in number, rather large, 5—10cm long, ovate to lanceolate, rather thin, smooth and coriaceous. Racemes usually terminal or arising from nodes opposite the leaf bases. Peduncle shorter or longer than the rhachis. Bracts lanceolate or subulate, about 8mm long, pale coloured. Pedicels about 1cm long. Flowers numerous, up to at least twenty in number, and pure white in colour, appearing slightly frosted. Sepals linear to lanceolate, varying in shape and length, up to 1—5cm long. Petals similar, somewhat narrower at the base. Spur almost straight, 5—8mm long, dilated at apex. Labellum attached to end of column foot with narrow claw as long as spur, expanded below apex of column into 2 short, pointed lateral lobes. Mid lobe linear to lanceolate, not undulate, at least two thirds as long as sepals, sometimes possessing a few purple spots. Callus slightly raised with longitudinal lines, usually small or obscure.

General remarks: — This species is a member of the section Dendrocoryne, but is an atypical member of that section. It is most closely allied to *D. aemulum* and *D. falcorostrum.* The plant is most readily distinguished by the rather tubular flowers, the presence of an obvious spur, and particularly by the petal-like labellum with its pointed lateral lobes, and virtual absence of features. These features are unusual among the Australian dendrobiums, and have led some to believe that the flower is peloric, (i.e. can be divided equally along more than one axis). However, this is not the case. Superficially the plant looks similar to *D. falcorostrum,* and in some clones the two are virtually indistinguishable except for the aerial growths normally found on *D. moorei,* but rare or absent on *D. falcorostrum.*

D. moorei was first collected by R.D. FitzGerald on Lord Howe Island in 1869. Later in that year it was first described by Baron von Mueller, and named in honour of Charles Moore. At the time Moore was director of the Sydney Botanic Gardens and was probably collecting with FitzGerald, as he named a number of the plants of Lord Howe. He later became N.S.W. Government Botanist, and held this post until about 1900. Other plants named in his honour include *Sarcochilus moorei* and *Nothofagus moorei,* the host tree of *D. falcorostrum.*

Lord Howe Island is about 480km north-east of Sydney and is a dependency of N.S.W., thus qualifying *D. moorei* as an Australasian species, as it is endemic to the island. The island is the most southerly coral island in the world, and is about 11km long and 1km wide. The climate is mild, normal temperatures varying between 14°C and 30°C, and humidity moderate, on the protected west coast. On the island *D. moorei* is locally abundant througout. It is found from sea level, where it is showered by sea spray, to an altitude of 870m on the summit of Mt. Gower, the island's highest point. At low altitudes the plant tends to grow on rocks, or occasionally as a terrestrial. Under these conditions the pseudobulbs are much shorter and stouter than is usual. At higher altitudes, in the forests, *D. moorei* grows on a variety of trees, including figs and palms. Particularly large clumps grow with elk horn ferns in pandanus forests. On mountain summits it is growing in cloud forest along with many other epiphytal plants. They favour humid areas, at least moderately well lit, and fairly low on trees, especially since few trees on the island exceed 15m . *D. moorei* shuns areas of dense scrub.

Cultivation: — This is a very easily grown species, and should be represented in all collections. It adapts readily to Melbourne's cold under bush house conditions. However, it tends to be a shy flowerer unless given some heat in winter. It can be mounted in the usual fashion on materials such as hardwood, tree fern or cork. However, *D. moorei* probably does best potted in a rich but open mixture, of, for example, charcoal, bark, rotten wood, and a bit of cymbidium mix or similar as a food supply. The main rule, as with all potted epiphytes, is to make sure that air spaces exist throughout the pot to ensure drainage and aeration of the roots. Better results will also be achieved by fertilising regularly with a variety of fertilisers, following the rule of never using at more than half strength. The plant produces aerial growths, or keikis, prolifically, and these are the best source of new plants. Just start the roots off in sphagnum, then pot up, and you will soon have an attractive specimen. Ernest Lortz, at Mallacoota, has a large plant growing under a fruit tree, which has been the source of many members' plants. The plant grows well under these conditions, but flowers sparingly, a situation which would probably be improved with a little winter warmth. *D. moorei* has been variously quoted as flowering in June/July, March/July, or under good conditions, rarely out of flower. It was awarded the bronze medal of Botanical Merit by the American Orchid Society, worthy recognition of its beauty. The flowers are almost invariably snow white in colour, the only recorded variations being one plant with purple spotted flowers, and another with a bronze tinge. Probably the last word on this attractive little flower should be given to the prose of R.D. FitzGerald: "When seen adhering to the black basalt of the chasms, the white waxy flowers, more like white hyacinths than orchids, make a beautiful contrast to the wildness of the scene. The flower is like a snowflake in the very act of melting."

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More Cultural Notes on *Rhinerrhiza divitiflora*

by Ernest Lortz, Helen Richards & Harry Schultze

As a follow-up to Ted Gregory's article on *Rhinerrhiza divitiflora* (*The Orchadian*, December, 1977), we give you the following exchange from the ANOS Victorian Group Bulletins of May and June, 1979:

Quoting from a letter from Ernest Lortz, Mallacoota:

"Now to the problem plants which in a way fascinate me. There is *Rhinerrhiza divitiflora,* a spectacular plant when in flower, and at least fascinating when not, and for me frustrating and challenging as well. I had several plants which either failed to establish, or very slowly put out a single root and after about two years, died back again. Now I am a keen reader of Ted Gregory's excellent and superbly written articles. He advocates for Raspy Root to mount it on paperbark with good shade and plenty of water. Now, I have not the slightest doubt whatsoever that this is the perfect treatment for plants in northern N.S.W. The question is, is that the right treatment for plants in our area? I was absolutely taken back when an acquaintance, who lives in the neighbourhood, brought to me one day the best specimen of Raspy Root I have ever seen. It had two magnificent flower spikes, the plant was very large, and the leaves golden green. Knowing that the proud owner only had a casual interest in orchids, I asked for his cultural secrets. He laughted, and said there were none. The plant hangs in his little bush house, north-west orientated, gets plenty of sun and very little water! ("I hardly watered it all summer long!" he said.) It would interest me now to have comments on this one."

Comment by Helen Richards (Editor of the Victorian ANOS Bulletin):

Barry and I have had several plants of *Rhinerrhiza divitiflora* (R.D. for short, as Ted Gregory says), and I don't think that we have lost one. They have been as follows: Our first plant came bare rooted from David Jones's nursery. We tried it in a terra-cotta pot, usual loose mix and hung it high in our cold glasshouse (our former, shady one). It did nothing for a long time, then slowly put out roots, and has flowered since.

Our next plants came from the Taree area, and these Barry tied firmly to a weathered hardwood plank (3 plants), retaining as many of the healthy roots as possible. The plank was hung vertically on the wall so that it faced east, at eye to knee height, and kept fairly moist, but well ventilated. The plant put out roots fairly quickly (over summer), and many of the old roots started growing again. Then in winter we nearly lost the lot through having them too wet in the cold weather. We cut off the blackened leaves, and were very relieved when the plant grew new leaves and roots the following spring. The plants are well established now, have flowered, and in our new sunnier glasshouse are in a shady but dryish corner, but being established, we have no worries with them.

We tied another plant of R.D. to a *Pittosporum* tree lining our drive, and for 18 months it did nothing except drop one of its two leaves. During that time *Sarcochilus falcatus* established happily in the next door tree, so the conditions should have been favourable. R.D. is now finally growing a new leaf, and a new root is also appearing.

Our other plants of R.D. we have bought already established on their paperbark poles, and they haven't looked back.

I think this plant is just slow to establish, and while establishing, needs more shade and water, but air movement must be kept up, and it must not get too wet and cold. Once established, it is no trouble.

"Now to *Sarcochilus australis:* It is such a dainty and beautiful little orchid that we would all like to see it in our collections. My experience is that it establishes easyly on various materials (I had a few plants thriving on bonsai trees) and seems at first to do well in cultivation. After two or three years, however, the plants die. I have noticed that they die in two different ways. The healthy looking roots all of a sudden shrivel and dry up. The plant may persist for a little while, and sometimes it may try to send out a new root, but invariably it will die. The second way is that the roots still look healthy and perfect whilst the crown or centre of the plant has simply wilted away. I would not have a clue what it could be, but I suspect perhaps some kind of micro-organism which is more prevalent in our artificial conditions than in the plant's natural habitat. What I found interesting is that in our area *S. australis* grows naturally often on Kanooka or Watergum trees (*Tristania laurina*). Now I have had a Kanooka in a bonsai container for eight years and it seems happy and well. But the two plants of *S. australis,* which were growing on it for 3 years and flowering for two, just died as suddenly as the two others which were established on a piece of paperbark.

I feel that until we know what causes the plants to die off, we should not persists in trying to grow them, except strictly for research."

Comment: We have tried several plants of *S. australis,* all of which died, except one. It was tied to a mossy log, hung horizontally under the bench where it was cool, moist but not wet, and hung close to a fan set in a brick wall, which sucked cool air from the shed next door into the glasshouse. This was as near as we could get to the cool breeze which was present in the gullies where we had seen *S. australis* grow. The plant existed for 3½ years — it didn't thrive, but it didn't die, and it occasionally put out a new root. Then we moved, and we obviously did not reproduce those conditions again successfully, as the plant soon died.

The following letter was received from Harry Schultze, regarding Ernest Lortz's problem plants:

"I have several plants of *Rhinerrhiza divitiflora,* some acquired 8 — 10 years ago and others just recently. It has been my experience that they thrive when attached to a piece of She-oak (*Casuarina*). The roots get into the crevices in the bark and grow strongly. Some plants came from beyond Newcastle, N.S.W. and others from the Toowoomba, Queensland area. They are grown in a cool glasshouse, hanging on the north wall with the foliage facing south. They flower every year with spikes 12 — 15" long. The recently acquired plants from Queensland (as were all the others) had been at least a week in bare root condition before being mounted, and after 4 months have produced roots and new leaves. I have not tried to grow them on any other medium.

Sarcochilus australis has also been tried in various positions in both the cool glasshouse and bush house without much success. A friend in Tasmania sent over several plants on the original twigs on which they were growing. The trees were being cleared from beside a creek and the plants were on branches over the water. Some were hung in a shaded spot in the bushhouse where they got plenty of moisture and fresh air. They existed for about 12 months, then died. Others were hung under the benches in the glasshouse with the same result, but one branch was fixed in a pot so that it stood upright, with sufficient compost in the pot to hold it firm. It grew nicely and flowered the first year, and was crossed with *Sarcochilus hartmannii.* The two pods produced were given to David Jones but I do not know how they turned out. It flowered again the following year and then gradually died. Another lot on branches from a friend at Bairnsdale was tried in similar positions in the bushhouse and glasshouse but these also suffered a similar fate. In the past thirty years I have only seen it displayed at an orchid meeting on about three occasions and one of these was by David Dawes at Mornington. Unfortunately, it has never been shown by one particular grower on any second occasion. I think this orchid is best left in its natural environment."

EPIPHYTES WITH PLEASURE

by Peter Vaughan

(Reprinted from NATIVE ORCHID NEWS (Darling Downs Group) of May, 1979)

I am writing a note to try to encourage members to grow the epiphytes naturally. I have been doing this for many years and have found it is an excellent method to learn culture techniques.

You should first start with your local species as environmental variables such as rainfall and temperature in your garden and in local orchid habitats are likely to be similar.

The next requirement is a host. A suitable tree would be a jacaranda, casuarina, hoop pine or any other tree with permanent bark that is to a degree corky or water retentive. Stringbarks or bloodwoods are not very suitable though I have found *D. canaliculatum* thrives on these. Then decide on the species to plant on the tree and go bush to observe where the plant grows. Take notice of such points as the particular habitat preferences of each species. For example, *Bulbophyllum weinthalli* and *B. bracteatum* are only found on the underside of branches on the southern side of the tree, i.e. the most protected position from the burning and drying effects of the sun.

B. exiguum and *B. crassulifolium* are found on the trunk, the former on all sides, thriving better on the south, but flowering better on the north. The dendrobes sit on the top or side of a branch but their roots roam to take advantage of the moister surface below the branch. Sarcanthinae always like shelter but *S. falcatus* and *Plectorrhiza* spp. can withstand more exposure than *S. olivaceous, S. divitiflora* or their friends.

I have yet to see *S. weinthalii* or *S. dilatatus* naturally but I have heard that they prefer the outer branches. *Liparis* and *Oberonia* prefer shelter, but for these one would have to choose a low position to appreciate the plants' flowers.

After you have decided the likes and dislikes of each species and noticed how there are always exceptions, you can go home to your tree and climb it. Starting from the top (I started mine from the bottom and destroyed the lower plants placing the upper ones), place those easily seen from afar or best displayed from below.

D. speciosum and *D. aemulum* suit the former category very well, whilst *D. gracilicaule* with its nodding flowers benefits from a higher position. All of the terete leaf species are enhanced by just hanging down to eye level. As you work down, remember the "sarcs" flower below the leaves, so 6 — 7 feet is a good height. Below this, oberonias and bulbophyllums are placed so we can view the flowers and on the outer branches plectorrhizas and taeniophyllums.

If you find that you are getting carried away and have cold growing exotics, then why not plant a few cattleyas on the top of branches where they get plenty of sun and tie a dead staghorn on with a stanhopea in it (watered well, the stanhopea eventually clings). Those *Sophronitis* species like the most sheltered position whilst a terete vanda on the trunk will grow and flower like never before.

I have got 36 species growing on one rock (a large rock, but the *D. speciosum* has 250 canes) and up to 10 species on a tree. I find ferns help give a balanced appearance and extra shelter where needed but they tend to cut off the water supply, so don't plant anything directly below them.

The Pros & Cons of this method are fairly simple:

Pros — Once established, no labour is needed, especially in the watering side.
— The plants are out of reach of small kids.
— We can learn a lot about various species by studying them in the field.
— Due to a more natural environment and no repotting they soon develop into your best plants.
— They look more natural and after all, isn't that why we are growing native orchids?

Cons— You have another place to water for at least a year.
— The plants are more exposed to insects (but they are not as concentrated as in the bushhouse, so it doesn't seem to be as much of a problem.
— When they develop into your best plants you can't take them to meetings and no-one will believe you.
— When the kids start to climb the trees, they knock them off (do unto others before they do unto your plants).

That just about sums it up; just remember that after collection, a plant has lost nine tenths of its root system, so it needs supplementary watering until at least half of it has been replaced with new growth and that we learn by looking at the plants in the bush.

◆ ◆ ◆ ◆ ◆

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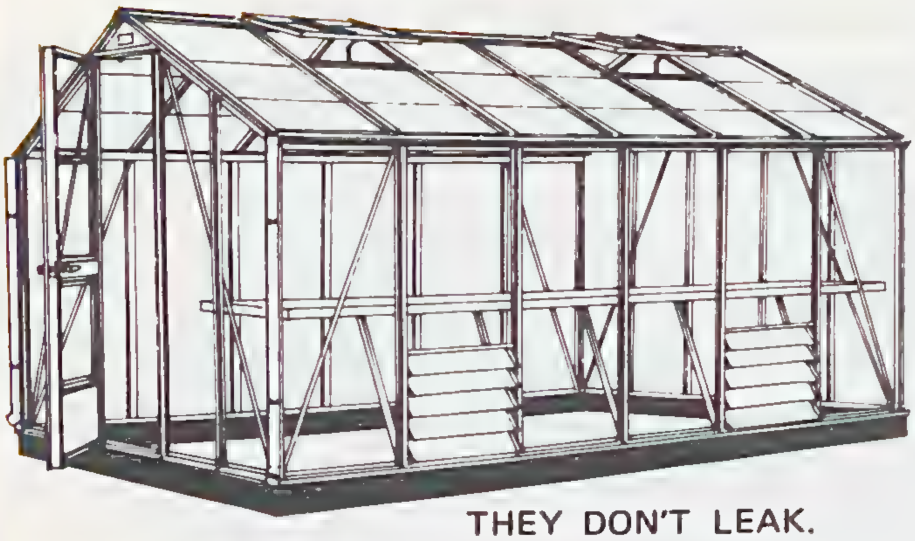

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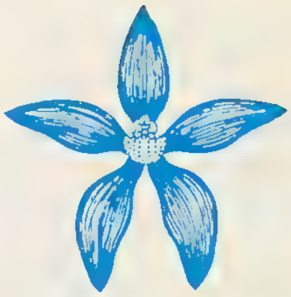
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30th October, 1979

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THE ORCHADIAN

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Honorary Associate Editors: Dr N.J. Grundon (Qld.), Mr J. Simmons (S.A.)

Volume 6 September, 1979 No. 5

EDITORIAL

Much can happen between quarterly issues of *The Orchadian,* especially when one takes a three months holiday overseas. Despite mail hold-ups, the June issue came out eventually, thanks to the efforts of our Assistant Editor, Peter Weston, and of Jim Walker as A.N.O.S. President.

The absence of Ted Gregory's seasonal notes from the present issue will disappoint many readers. The explanation is simple. Ted has moved from his home at Taree, N.S.W. to go north into Queensland. We trust that we shall be able to give you more from him in due course. Other people on the move are Peter Vaughan (to Malaya) and Dorothy Cooper of New Zealand (to England until the end of 1980).

New writers in this issue include Dorothy Woolcock ("Orchids of South West Victoria"). Her work is beautifully illustrated by her husband, Collin Woolcock. Collin is well-known for his delicate and accurate colour illustrations in the new edition of Black's "Flora of South Australia". We are extremely fortunate to have his line drawings, done especially for *The Orchadian.* He has also provided a series of decorative floral emblems for our cover and some sylised " filler" designs which you will see from time to time. These are "custom-designed" for us and, again, we are most grateful. If we can eventually afford to reproduce colour illustrations, readers will be able to appreciate fully the skill of Collin Woolcock as a botanical artist — especially his terrestrial orchids.

Speaking of "terrestrials" — our members in the southern States will be interested to hear that the A.N.O.S. Spring Show of 1979 at Mona Vale, Sydney, saw *Pterostylis baptistii* (a plant owned by Peter Hind) win the silver medal trophy for Champion Native Species Orchid. Epiphytic species dominated this show as is usual in these latitudes, but for the third time in five years the champion species was a terrestrial.

It has been suggested to me that, although terrestrials may be more demanding in their special needs, their growers have the advantage because last season's defects, whether they be insect blemishes or other leaf-damage, do not carry forward to the next season when the new foliage gives the grower a fresh start on the way to perfection.

Rhizanthella gardneri R.S. Rogers, that subterranean terrestrial of Western Australia, was in the news shortly before I left Australia early in June. We saw it even on the television news at peak viewing time. Catching up on my reading I find it has had plentiful coverage as a news item in most orchid bulletins and newsletters. So, in this issue, we give you a rather more authoritative article written by A.S. George of the Western Australian Herbarium for the Western Australian Native Orchid Study and Conservation Group (Inc). Also, we give you some personal reminiscences by Harold Goldsack of the first discovery of the new genus *Rhizanthella* and the naming and description of its only species by Dr R.S. Rogers. Very appropriately, A.N.O.S. Council, having received a number of photographic colour slides from Mr Andrew Brown, a member in Western Australia, has arranged to make copies available to all A.N.O.S. members. Illustrations of *Rhizanthella gardneri* in the past all seem to have been hand drawn from herbarium material — no doubt because of the difficulty of photographing such a plant in its natural habitat. With the recent discovery, however, Mr Brown has been able to send us colour photographs. (See details of the offer to A.N.O.S. members at page 113 in this issue).

For those readers who are fascinated by the rarities of Australasia, it is worth emphasising that only three subterranean-flowering saprophytic orchids are known in the world. One of these, *Corybas cryptanthus* E.D. Hatch (1956), is endemic to New Zealand, while the other two are *Cryptanthemis slateri* Rupp (1932) of N.S.W. and Queensland and *Rhizanthella gardneri* R.S. Rogers (1928) of Western Australia. These are compared with other underground saprophytes in an article by S.C. Clemesha in *The Orchadian* Vol. 2, pp. 141-143, March, 1968. Clemesha stated that "*Cryptanthemis* was discovered accidentally when Mr Slater was digging up a plant of the leafless saprophytic orchid *Dipodium punctatum* in an attempt to cultivate it (which doubtless failed)."

And this leads me to a somewhat unpleasant message I must convey to all contributors to *The Orchadian.* A.N.O.S. Council has adopted a suggestion that future articles referring to orchid collecting in the wild must contain a statement by the author that permission to collect plants had been granted by the appropriate authority or landowner. Compliance with this is necessary both to facilitate publication and to lighten the editor's increasing burden of correspondence. I do not wish *The Orchadian* to adopt a bureaucratic posture, but it may be found easier to reject an article than to write a letter to the author seeking the necessary statement and thereby delaying publication. We should not like to see a contributor or his (or her) associates prosecuted for actions described in *The Orchadian.* I trust that contributors will rely upon my judgement as I rely upon theirs. Together we should be able to keep it simple and unobtrusive — especially for example where readers are expected to appreciate that an article is written in lighter vein as was the Bonalbo piece by Peter Vaughan in the June issue. That article caused some concerned comment in spite of my editorial hint ("Can the writer be serious?" and "There is more in Peter's articles than meets the eye at first glance"). Anyhow, Peter has made amends in a "Letter to the Editor" in this issue and I hope to have more articles of his from Malaya (typed and fully annotated, of course).

(FEEDBACK & FOLLOW-UP on page 117)

ORCHIDS OF SOUTH-WEST VICTORIA

by D.T. Woolcock

As L.T. Nesbitt has stormed the citadel of the Epiphytic East and North of Australia with his article on "Terrestrial Culture Notes" in *The Orchadian* March, 1979, there is a less diffident feeling now about announcing that all the orchids found in the bush in south-west Victoria, as in South Australia, are terrestrials. Recently, I was confronted with the statement (from a well-known orchid buff — no names!): "Actually, I have never taken a real interest in the similar-looking blue thelymitras —", so I felt some trepidation in mentioning just terrestrials. However, with L.T. Nesbitt's article giving some moral support, here is the South-West Victorian list.

For the purposes of this article, south-west Victoria can be defined by the map issued by the Land Conservation Council of Victoria for "South Western Study Areas, Districts I & II". The whole area is bounded to the west by the South Australian border; to the north by the road from Frances, South Australia (on the border) running east through Goroke and Natimuk to Horsham; on the east side, Horsham to Stawell and Ararat, then south-west to Yambuk on the coast; and the southern edge is the coastline from Yambuk through Port Fairy and Portland to the South Australian border at Nelson. The area includes the Lower Glenelg National Park, the Grampians and the Black Range, both Forest Commission Reserves, several smaller National Parks and Reserves, and large State Forests, mostly in the western half. New National Parks have been declared on the coast at Cape Neslon (south of Portland) and along Discovery Bay to Nelson, at the mouth of the Glenelg River. With this area conserved in the coastal heathlands, adjacent wet heathlands, also the forests and mountains of the Grampians, the terrestrial orchids have, at least, scope for survival from encroachment by pine forests and pasture.

South-west Victoria has a good rainfall, the average lying between 25 — 35 inches, is seldom touched by severe drought, and the temperature normally does not rise to the extreme heat of the inland nor fall to the frosts and snow of the mountains in eastern Victoria. There are about 120 species of terrestrial orchids growing in the district and their flowering is spread over the whole year, rising to a peak in late winter and spring but continuing through the summer and autumn, so that there is no month without a few species in flower. Geographically it is interesting, too, as it provides the 'disjunct' area where a few Western Australian and South Australian species halt their eastern spread in southern Victoria and some of the eastern Australian species go no further than the south-east corner of South Australia. Such species as *Thelymitra canaliculata, T. fuscolutea, T. macmillanii, T. mucida, Pterostylis vittata, Microtis orbicularis, Leporella fimbriata,* grow in Western Australia, South Australia and Victoria, but not along the east coast of Australia; while *Arthrochilus huntianus, Burnettia cuneata, Prasophyllum flavum, Caladenia iridescens, C. lyallii* and *C. pallida* do not grow west of Victoria. These lists are not exhaustive and are meant only as a guide to the distribution of some terrestrials. A large number of Tasmanian orchids occur also in Victoria, especially in the southern districts, as the climate is very similar along the north and east coasts of Tasmania to that of coastal and mountain Victoria.

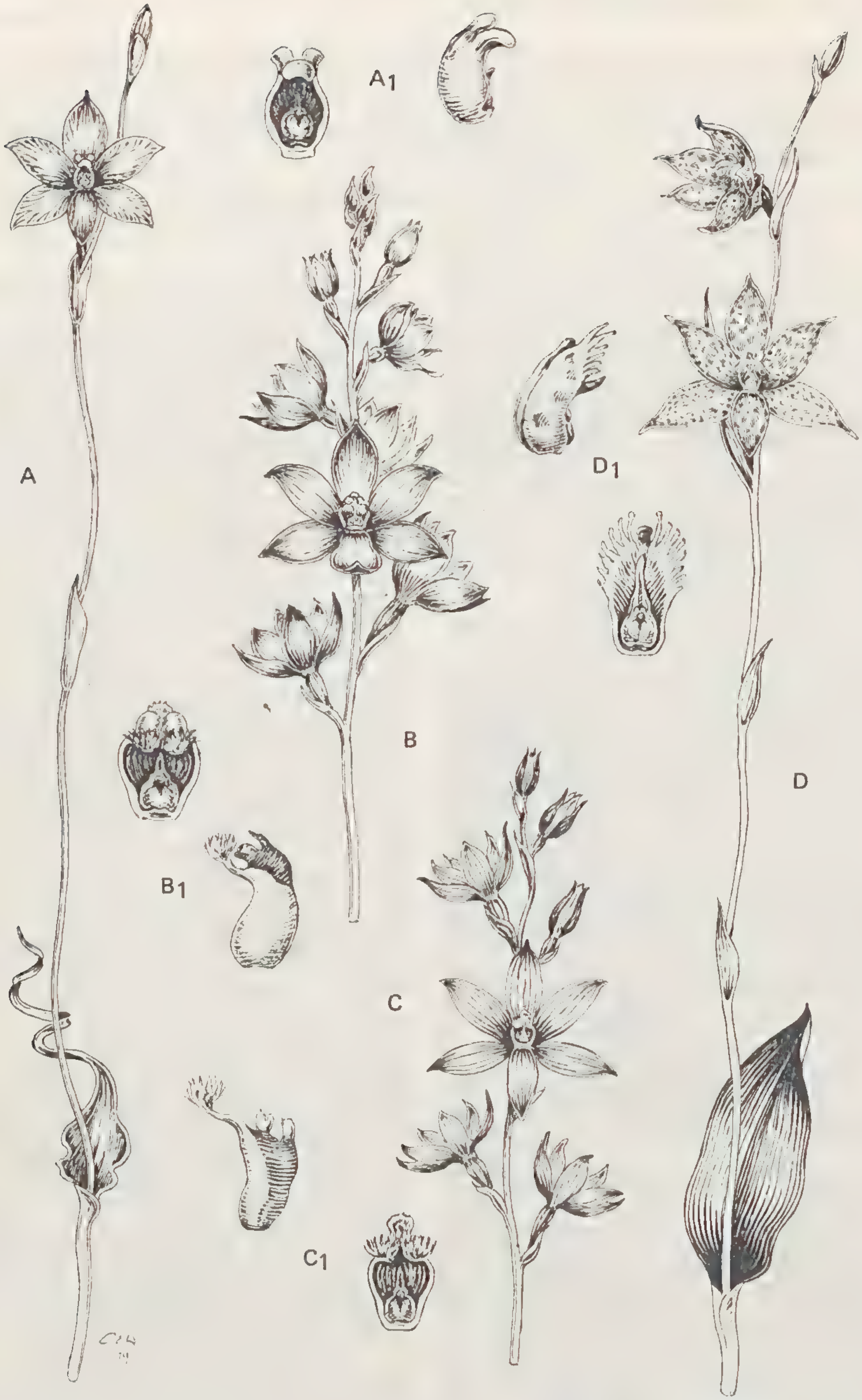
The following list of the orchids of south-west Victoria (as defined above) is accompanied by illustrations by C.E. Woolcock of some of the endemic or rarer species.

Although the climate, even through Spring, is often wet and cold along the coast and in the Grampians, there is still a large and interesting group of *Thelymitra* species in the district. Usually the widespread and locally abundant *T. antennifera* is the first to flower in September, followed by *T. matthewsii* in the southern and northern ends of the Grampians, growing there in quite good colonies but otherwise restricted in range. Most of the Sun Orchids flower in October and the list includes *T. pauciflora, T. rubra, T. nuda, T. megcalyptra, T. aristata, T. epipactoides, T. flexuosa, T. chasmogama, T. luteocilium, T. macmillanii, T. fuscolutea, T. holmesii, T. carnea, T. ixioides, T. irregularis,* while *T. canaliculata* and *T. mucida* flower in November and *T. venosa* in December. In Western Australia and South Australia, *T. canaliculata* flowers in early October, but on the sandy, wet Glen Isla flats, about 65 km south of Horsham, it is mid-November before it is in bloom and it can flower even in the first half of December.

Weber and Bates (1978) have made *T. nuda* and *T. megcalyptra,* both widespread in the district, synonymous with *T. longifolia* and have classified *T. carnea* and *T. rubra* as *T. carnea* var. *carnea* and *T. carnea* var. *rubra,* the former occurring in good colonies in the northern Grampians but less extensively in the south, where *T. rubra* is spread widely through the wet, sandy forests. *T. aristata* (formerly *T. grandiflora*) grows abundantly in very wet forest areas and can make a magnificent display of tall spikes, up to a metre high, with colours ranging from pale blue through mauve to dark blue. *T. luteocilium* and *T. chasmogama* are scattered in wet depressions in heathland and forest, but are localised and uncommon. The beautiful *T. epipactoides,* the Metallic Sun Orchid, is now rare in south-west Victoria, as its habitat has been cleared for pasture or pines, but it survives in a few colonies on private property and occurs also in South Australia. *T. fuscolutea,* so widespread in the south-west of Western Australia, is somewhat scattered in occurrence but does well in its chosen areas and grows as far east as Anglesea, near Geelong, though it is rare east of Melbourne. *T. mucida,* another of the Western thelymitras, which does not appear to grow east of Melbourne, is scattered through several sandy swamps of the south-west corner and has recently been found in forest swamps near Portland. *T. macmillanii* is limited to a few localities in the west and centre of the district but flowers irregularly, according to the season; while *T. holmesii,* also scattered and rare, grows in similar wet depressions. *T. venosa* makes a very limited appearance in the Grampians, also in a swampy habitat.

The autumn species are fairly limited in number — perhaps because of the rainfall that comes mainly from the southern fronts and rarely from the monsoonal lows of the north and east of Australia. In some years the autumn rains are late and the autumn species can be reduced in numbers and size. *Chiloglottis reflexa* is widespread, but scattered, in sandy forests and flowers from mid-January to May and June, depending on the rain. Of the small prasophyllums, *P. despectans* occurs rarely in coastal heaths; *P. beaugleholei* on the edge of Red Gum Swamp (Lower Glenelg National Park); *P. nigricans* in wet, sandy depressions of Mt. Richmond National Park; *P. rufum* (formerly *P. nigricans*) and *P. morrisii* occur in the Grampians and near Stawell. *Spiranthes sinensis* is well distributed through swampy areas of the south coast and forests, even growing in a wet ditch at the side of the road! *Eriochilus cucullatus* grows throughout and *Leporella fimbriata* also is very widespread in wet, sandy heathlands and sandy forests along with *Acianthus exsertus,* which forms profusely flowering colonies. *Acianthus caudatus* and *Acianthus reniformis* flower in late winter and are widespread in similar habitats. And *Prasophyllum archeri* has been overlooked in the autumn list — maybe because of its size and scattered appearance!

Pterostylis revoluta is usually the first of the Greenhoods to appear and is widely scattered over dry, stony hillsides in the Grampians and open forest near Stawell. But the Pterostylis genus is very well represented in the south-west region and *P. revoluta* is closely followed by *P. parviflora, P. alata, P. nutans, P. concinna, P. vittata, P. curta,* and *P. longifolia* — all of which are well established in the district and often occur in large colonies,



DRAWING: Collin Woolcock

A *Thelymitra mathewsii* x1
B *Thelymitra epipactoides* x1
C *Thelymitra canaliculata* x1
D *Thelymitra fuscolutea* x1
A1, B1, C1 and D1 enlargement of column

flowering from the beginning of winter through to spring. Several other species come into flower at the beginning of spring – *P. pedunculata, P. cucullata, P. foliata, P. cycnocephala, P. plumosa, P. X ingens, P. mutica,* – and later *P. alpina, P. rufa, P. biseta, P. mitchellii, P. falcata, P. tenuissima.* Through clearing and development, *P. cucullata* is reduced to a small colony surviving near Bridgewater Lakes on land leased for grazing. *P. celans,* the Portland greenhood, has been reduced by Jones (1977) to a 'teratological development of *P. nana* R.Br.' *P. foliata* flourishes on limestone ridges and sandy coastal heathland and is widely established in Bats Ridges Faunal Reserve, west of Portland and in Cape Nelson National Park to the south of Portland. It occurs also in Tasmania. *P. tenuissima* is an interesting Greenhood of the south coast and, though scattered, grows in relatively large numbers in its chosen habitat – in association with *Leptospermum lanigerum* (the Woolly Ti-tree) on the edges of swamps or creeks. In these conditions it occurs on several private properties – also in the Discovery Bay Coastal Park and across the border in South Australia at Piccaninny Ponds Reserve. *P. vittata,* one of the commonest and most widespread greenhoods of Western Australia, does well in the Portland forests of Mt. Clay, in some coast heathlands, further north in the Black Range, also at Anglesea, south-west of Geelong, but doesn't appear to go far east of Melbourne. *P. furcata* is named for the district from an isolated find at Condah, 50 km north of Portland, in November, 1905, but it hasn't been seen since in the area. Most of the "rufa" species – *P. rufa, P. biseta, P. mitchellii* – are in the northern section of the district – in the northern end of the Crampians – though *P. rufa var. aciculiformis* was found recently as far south as the Rennick Forest, just 5 km east of the Victoria/South Australia border, not far from Mt. Gambier. *P. falcata* grows in large colonies on the edges of swamps and creeks, particularly Red Gum Swamp in the Lower Glenelg National Park – and here, too, is a small colony of *P. X ingens.*

Corybas species start flowering in late June and are very widespread on the sandy forest floor, often under Bracken. *C. dilatatus* and *C. unguiculatus* are in flower together and are followed by *C. diemenicus* and, later, a rare occurence of *C. fordhamii.*

Diuris palustris, favouring sand on limestone ridges, flowers in early September and, though it does well in South Australia, goes no further east than Melbourne. *D. longifolia, D. maculata, D. pedunculata, D. sulphurea* occur throughout, but *D. punctata* appears in scattered groups in the Grampians. *D. pedunculata* thrives in massed effect along the verges of several highways and *D. longifolia* is well established in wet heathland.

Among the early spring orchids are *Caladenia deformis* and *C. latifolia* and these are followed – through September, October and November – by *Caladenia clavigera, C. carnea, C. angustata, C. iridescens, C. reticulata, C. tessellata, C. caerulea, C. filamentosa, C. patersonii, C. dilatata, C. menziesii, C. cucullata* and, at the end of spring come *C. congesta, C. hastata, C. pallida, C. lyallii.* In the Portland area *C. congesta* is spread widely in the wet, sandy forests and *C. dilatata* can flower as late as early December in the coastal heathland.

C. hastata is now restricted to a few small colonies in south Portland and is at risk because it grows in Portland Harbour Trust land ear-marked for industy. *C. pallida* appears to have vanished because of forest clearing for pasture and *C. leptochila,* reported for Mt. Richmond National Park, has not been rediscovered. *Caladenia patersonii var. suaveolens,* endemic in the Portland area, grows well in scattered colonies in coastal heathland and is a delightful greeny-yellow form of the species with a pleasant perfume. It is interesting to note that *C. caerulea,* which also grows in Western Australia, is not listed for South Australia in Weber and Bates (1978), though J.H. Willis (1962) lists a single record for the Bugle Ranges in South Australia.

Gastrodia sesamoides, Calochilus robertsonii, C. paludosis, C. campestris, C. herbaceus, occur throughout the south-west in October, along with *Burnettia cuneata,* though this latter species only after a fire in swampy heathland. *Lyperanthus nigricans* is widely distributed but, like *Burnettia cuneata,* flowers profusely only after fire and then not to the extent of the same species in Western Australia. *Glossodia major* is a common orchid throughout, as is *Microtis unifolia.* In late Spring, *Microtis atrata, Paracaleana minor* and *Arthrochilus huntianus* have appeared. *Caleana major* grows well on Mt. Clay near Portland but flourishes in the Grampians, growing with *Paracaleana minor* and *Arthrochilus huntianus* in the same areas. David Jones (1977) has reduced *Paracaleana sullivanii* to a "self-perpetuating aponoictic development of *Paracaleana minor.*"

The summer orchids include *Cryptostylis subulata,* widely distributed in swamps; *Orthoceras strictum,* also throughout in wet areas; and *Prasophyllum flavum* and *P. australe* in flower in December. *P. flavum,* in a few sparse colonies, has lost some of its territory to pasture and leads a somewhat precarious existence on a forest roadside, but *P. australe* is a swamp and fire lover, so is abundant under those conditions. The late Spring *Prasophyllums* listed are: *Prasophyllum elatum, P. brainei, P. patens, P. odoratum, P. frenchii, P. fuscum, P. hartii, P. parviflorum, P. diversiflorum,* with unsupported records of *P. rogersii, P. subbisectum, P. pallidum, P. brevilabre.* Of these *P. diversiflorum,* recorded in the 1940's, has been lost by clearing of land; *P. pallidum,* recorded from Pomonal in 1932, has not been rediscovered there; *P. rogersii* from Mt. Clay, Portland, is unconfirmed by later records. Weber and Bates (1978) have made *P. frenchii* and *P. gracile* synonymous with *P. fuscum var. fuscum.*

Chiloglottis cornuta is recorded from one locality – Heathmere (17 km north of Portland) and *Chiloglottis trapeziformis* occurs on the extreme west boundary of the district, though *Chiloglottis gunnii* is widespread in the northern parts.

Dipodium punctatum is the last summer orchid – spread very widely through the forests and making a most attractive showing, with its tall spikes, through January and February.

Of the south-west Victorian orchids listed above, several species are recorded in the lists of "Australian Plants at Risk", Occasional Paper No. 3 – published by the Australian National Parks and Wildlife Service. These are: – *Thelymitra epipactoides, T. matthewsii, Prasophyllum subbisectum, P. diversiflorum, P. fuscum* (N.S.W.), *Burnettia cuneata* – and these are few compared with the large number of orchid species at risk in Western Australia – unhappy thought!

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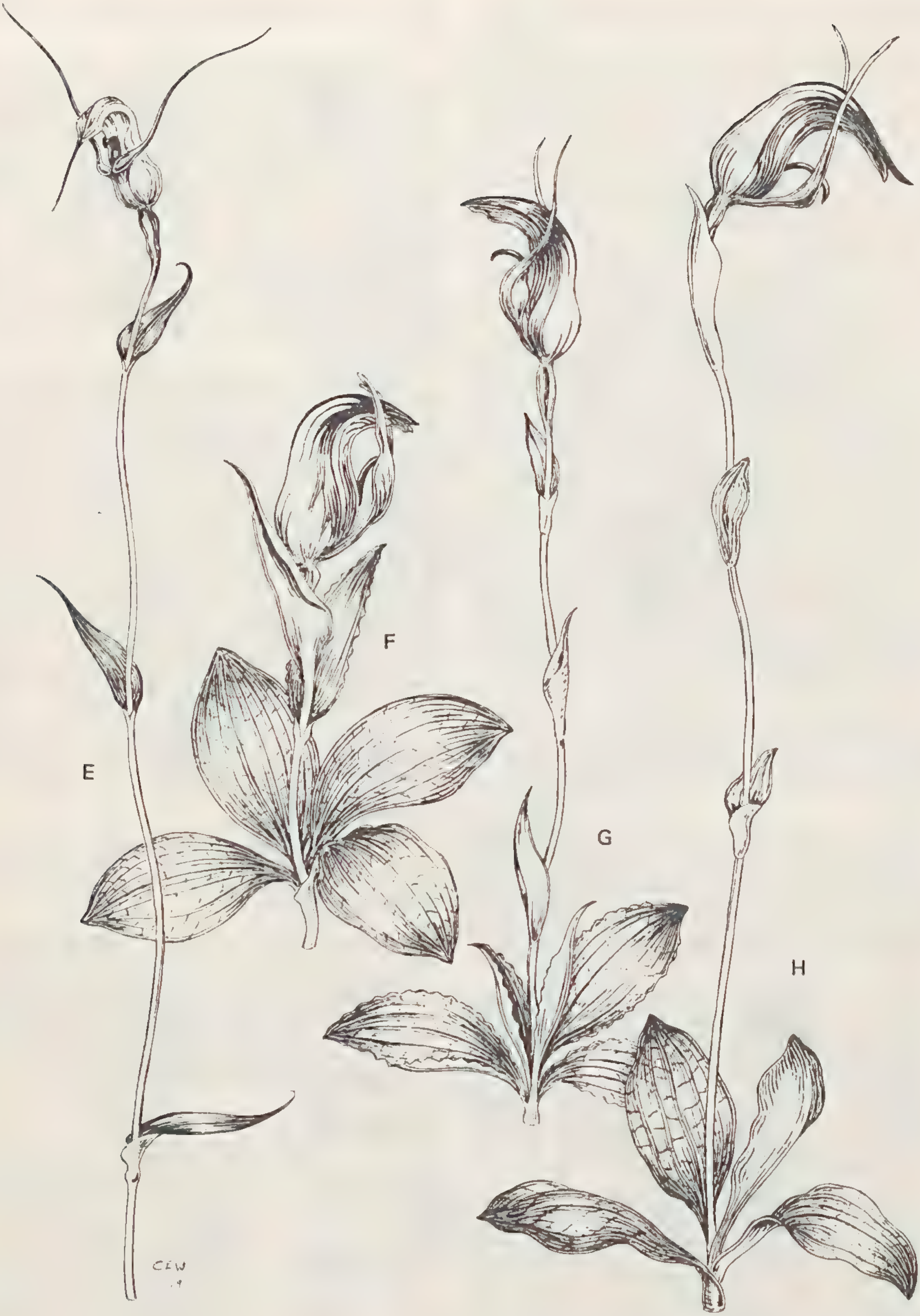
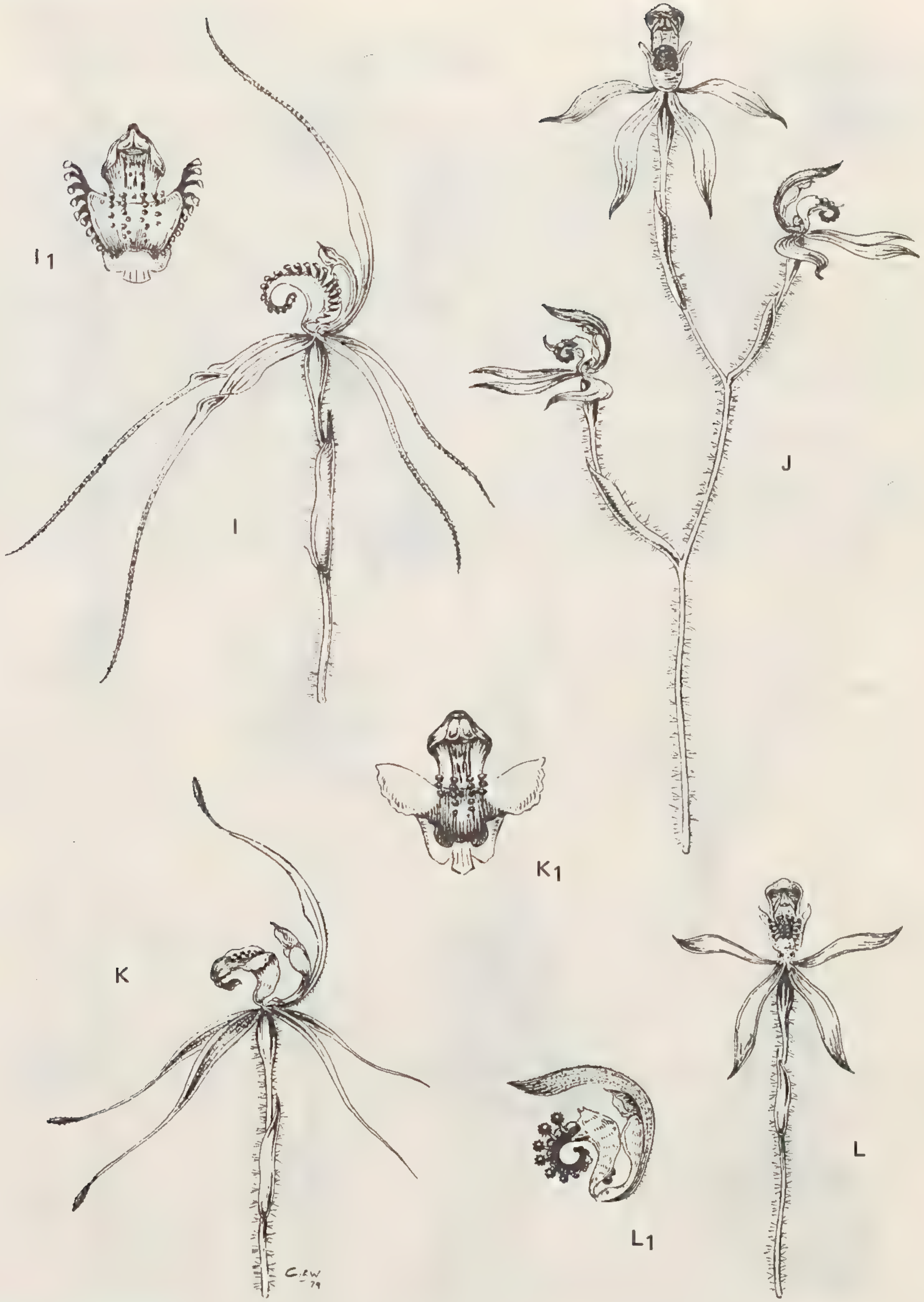
36 Townsend Street
June 12th, 1979 **PORTLAND, Vic. 3305**



DRAWING: Collin Woolcock

E *Pterostylis tenuissima* x1
F *Pterostylis cucullata* x1

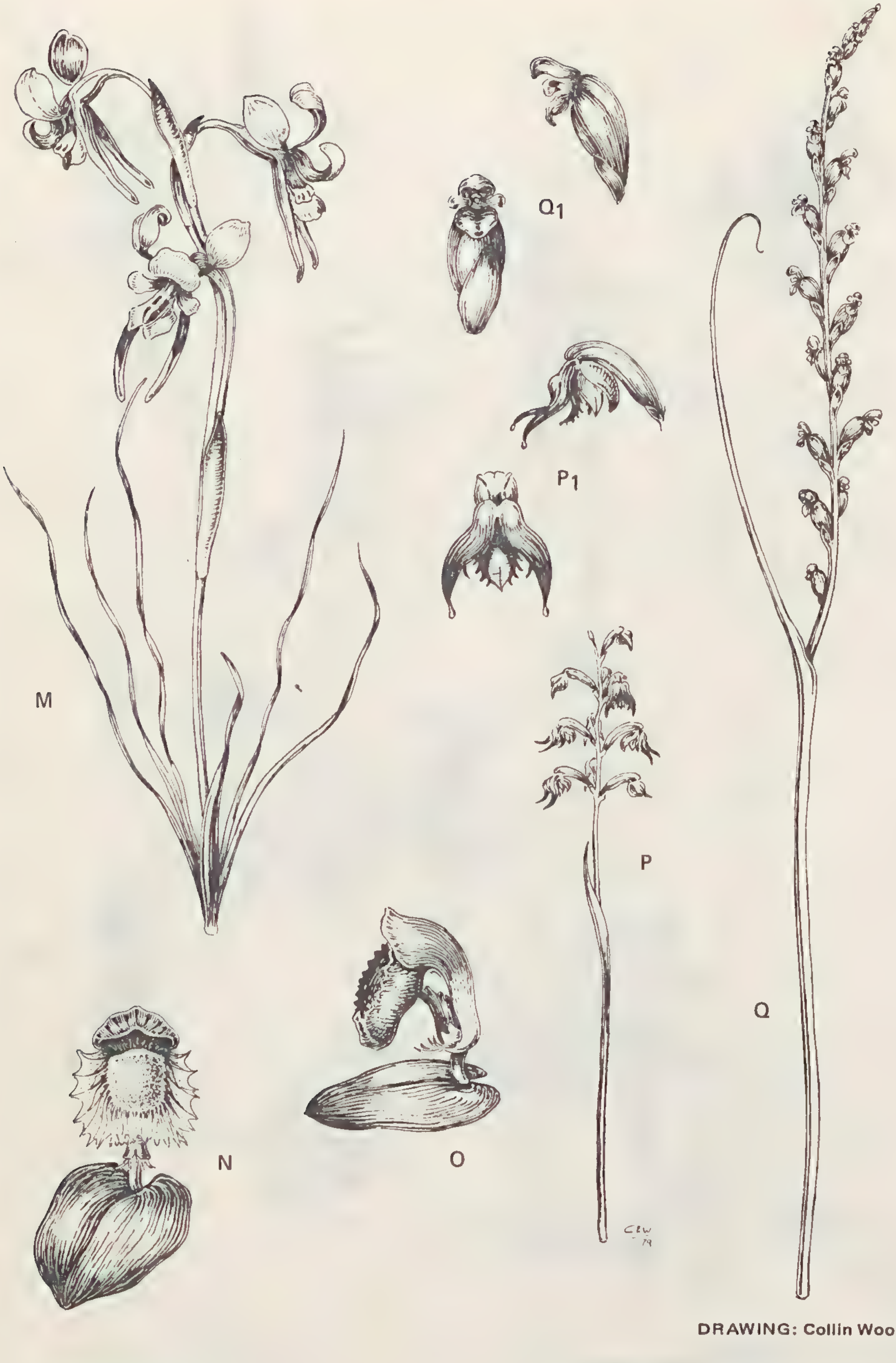
G *Pterostylis foliata* x1
H *Pterostylis X ingens* x1



DRAWING: Collin Woolcock

I *Caladenia pattersonii* var. *suaveolens* ×1
J *Caladenia congesta* ×1
K *Caladenia clavata* ×1
L *Caladenia irridescens* ×1

I1, K1 and L1 enlargement of labellum



DRAWING: Collin Woolcock

M *Diuris palustris* x1
N *Corybas dilatatus* x1
O *Corybas diemenicus* x1

P *Prasophyllum beaugleholeii* x1
Q *Microtis orbicularis* x1
P1 and Q1 enlargement of flower

Native Orchids of New Zealand

5 – *Pterostylis trullifolia* Hook. f; *Pterostylis brumalis* L.B. Moore; and *Pterostylis alobula* (Hatch) L.B. Moore

by Dorothy Cooper

My previous article was on two of our larger *Pterostylis* species – *oliveri* and *irsoniana.* In this issue I thought I would describe three of our 'baby' endemic species of *Pterostylis* – *P. trullifolia, P. alobula* and the rarer *P. brumalis.*

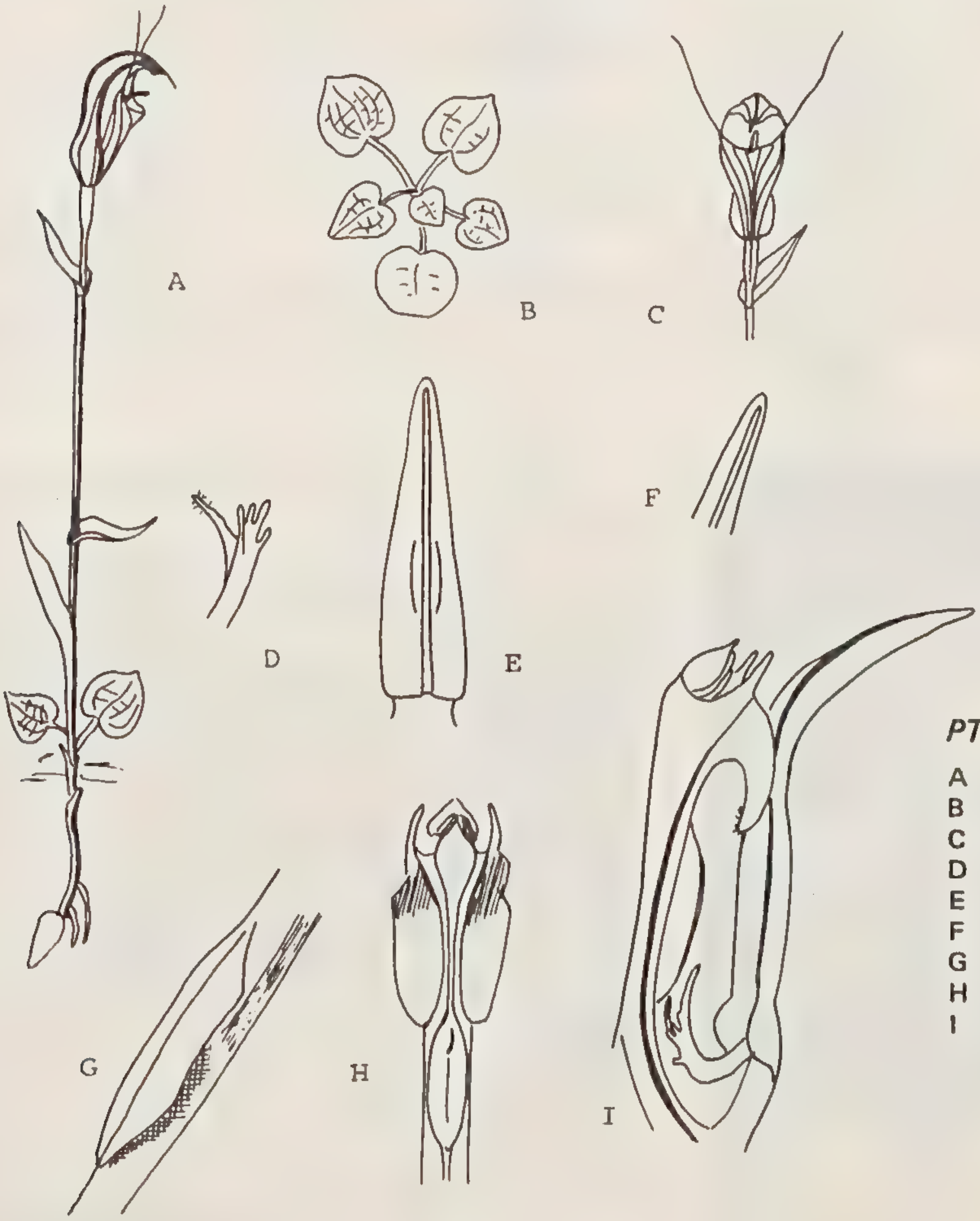
P. trullifolia is common north of Rotorua, and is also found in the Wellington district; *P. brumalis* is found only in localities not extending much further south than Auckland City; *P. alobula* is very common in the Wellington district and occurs throughout the North Island and in the northern part of the South Island.

All three usually have solitary flowers and are smallish plants not exceeding 25cm tall. They start out with petiolate leaves up to 10 or 15mm in diameter forming separate non-flowering rosettes, but as they develop into flowering plants these stalked leaves are only found spaced out on the lower part of the flowering stem; stalked leaves are apparently usually absent on flowering stems of *P. brumalis.* The cauline leaves in all three species are mostly sessile, that is, without stalks, and are quite different in shape. The stem and some parts of the flower are often marked with red.

They grow under forest scrub, in mossy areas and in the case of *P. alobula* also in sand dune country. I am sure that the latter type of locality would be easier to search in. In the Wellington area I usually find myself on hands and knees crawling under scrubby manuka and, on one occasion, ending upside down over a steep bank effectively 'stuck' between numerous saplings until given a hand-up! (I often laugh at the picture an eager orchid hunter must present to people we meet on the bush tracks – we're usually on hands and knees, peering through a lens or crawling through scrub.)

All three of these species have small tubers; the 'tails' of the sepals overtop the galea or hood, the column is shorter than the labellum, and the stigma is elliptic and slightly prominent. The petals are almost as long as the dorsal sepal and they all have similar labellum appendages. E.D. Hatch listed them as varieties of *P. trullifolia,* but L.B. Moore resorted and reclassified them in 1969 giving them new ranks. They flower during the winter and early spring.

The main differences between the three are the shape formed at the junction of the lateral sepals, form of the labellum, the width of the exposed margin of the petals, and they have different geographical limits of distribution. Other differentiating factors are the shape of the rosette leaves, the position of the uppermost leaf, spacing of the leaves and height of the hood.



PTEROSTYLIS TRULLIFOLIA

A	flowering specimen
B	non-flowering rosette
C	flower from front
D	labellum appendage
E	labellum from above
F	labellum tip
G	stigma
H	column from front
I	column and labellum

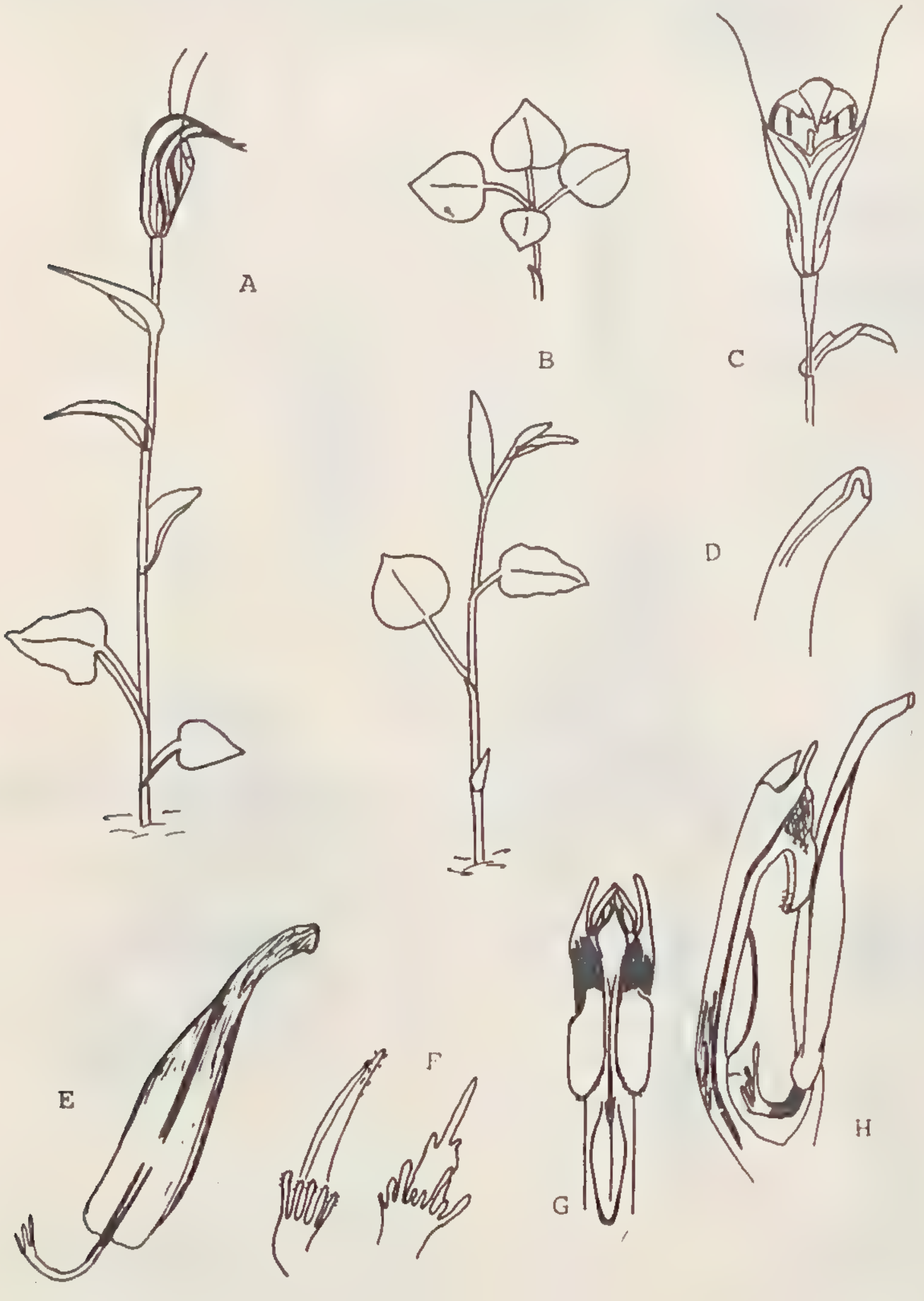
Drawing: Dorothy Cooper

P. trullifolia Hook.f. has more or less heart shaped rosette leaves, 5-15mm in diameter with 13mm stalks and embossed veins. Leaves further up the stem have no stalks and are 5-20mm x 2-5mm; the uppermost one does not reach the ovary. The junction of the lateral sepals projects a little forwards while the labellum is evenly tapered and has a narrow tip, its anterior portion arches forwards and protrudes from the flower. The dorsal sepal is 1-1.5cm tall and its tip is more or less horizontal as are the petals which have a narrow exposed margin. The plant grows up to 25cm high, usually less, and the internodes are of greater length than the leaves. We have found this species in the eastern hills of Wellington but it is not nearly as common as *P. alobula.* It flowers from June to October.

We have not yet found *P. brumalis*; it is only recorded from north of Auckland but L.B. Moore and E. Edgar in *Flora of New Zealand* Vol. 2 distinguish it from the other 2 species described here as being up to 20cm tall, with an internode length usually less than that of the leaves. The stalked rosette leaves are more circular, are 5-12mm in diameter on 12mm stalks without the prominent veins of *P. trullifolia.* Stalked leaves are usually absent from flowering stems. The linear cauline leaves are 1.5-4cm x 2.7mm, the uppermost one overtops the ovary but does not reach the height of the hood. The junction of the lateral sepals projects abruptly into a characteristic knob in lateral view. The labellum is a narrow triangular shape, its tip is slightly curved but less than that of the other 2 species. The dorsal sepal is 1.5-2cm tall with its tip bent more or less downward, while the petals have a relatively wide marginal strip exposed. It flowers from April to August. L.B. Moore compares it with the Australian species *P. obtusa.*

The third species *P. alobula* grows only to 10 or 15cm tall. The stalked rosette leaves are 5-10mm long and are spade shaped usually without prominent veins. The linear leaves on the stem are 5-25mm x 3-6mm, the uppermost usually extending slightly above the ovary. Internodes are about the same length as the leaves. An easy identification is made from the junction of the lateral sepals which in this species is relatively smooth with no projection while the labellum is also diagnostic. It is arched and protrudes from the flower but it narrows gradually from its base to mid point then more abruptly and the margins recurve so the top half is narrow with a deep channel beneath. Its tip is truncate — as if cut off with a sharp instrument. The dorsal sepal is 1.5-2.5cm tall and its tip is horizontal. The petals have a medium width strip of margin exposed. This species has a longer flowering period, from April to October. Its nearest Australian relative would seem to be *P. alata.*

14 Avalon Crescent
LOWER HUTT, NEW ZEALAND



PTEROSTYLIS ALOBULA

A flowering specimen
B non-flowering rosette and developing flowering stem
C flower from front
D labellum tip
E labellum
F labellum appendage
G column from front
H column and labellum

Drawing: Dorothy Cooper

A note on *Dipodium hamiltonianum*

by S.C. Clemesha

I was rather surprised in *The Orchadian* Vol. 6, No. 4 p. 75 (June, 1979) that M.A. Clements stated "Clemesha when replying to Nash (1968) about the status of *D. hamiltonianum* agreed with the latter's treatment of referring to these plants as a variety of *D. punctatum* . . ."

I did not remember doing this, so I checked the relevant Orchadian (January, 1968) p. 129 (Vol. 2, No. 10) and found things were as I thought.

I did not agree with treating *D. hamiltonianum* as a variety of *D. punctatum.* I did state that I could see how such an opinion could be formed and that a strong case for recognition of the plant as a variety could be made.

My concluding statements on the matter, however, were: "I would agree with the treatment of *D. hamiltonianum* as a variety of *D. punctatum* were it not for the nature of this genus as a whole. The flowers of the two saprophytic Australian species *D. punctatum* and *D. hamiltonianum,* two leafy terrestrial clump forming tropical species, *D. ensifolium* F. Muell. from North Queensland and *D. paludosum* from Malaysia and Indonesia and epiphytic normally single stemmed *D. parviflorum* and *D. pictum* — both from Malaysia-Indonesia are all very similar. All bear spotted flowers, the base colour of which is yellow or pink though unspotted forms of *D. punctatum* exist. The labellum shape of them all is also basically the same and all have pubescent labella to a varying degree. If we were to reduce any one of these it would be difficult to justify the separation of the others unless because of their growth habit . . ."

In Orchadian Vol. 2, No. 9, p. 111 and 112 (August, 1967) I stated of *D. hamiltonianum* it ". . . was named after Mr A.G. Hamilton, the discoverer, who collected many orchid specimens while a school teacher at Guntawang via Mudgee . . ."

This is an error. The plant was named after Mr James Hamilton, who collected it on an island of Moreton Bay. I would like to thank David Jones for pointing this error out to me.

A note on *Dendrobium dicuphum* F.Mueller.

by J.T. Simmons

Of the 55 odd species of *Dendrobium* which are indigenous to Political Australia, there are two representing the Phalaenanthe Section — *Dendrobium bigibbum* and *Dendrobium dicuphum.* This of course ignores the rather complex putative hybrids between the Phalaenanthe and Ceratobium Sections which involve some varieties of *D. bigibbum.* In some respects *Dendrobium dicuphum* has been over shadowed by the more spectacular *D. bigibbum.* Its natural habitat is much less accessible and it was once thought to be endemic to the northern section of N.T. but has since been found to occur in the north-west of Western Australia. It also occurs on Groote Eylandt in the Gulf of Carpentaria as well as on Bathurst and Melville Islands. A recent encounter with *D. dicuphum* in its natural environment gave me some appreciation of what a remarkable species it can be. In mid-July, while returning to Darwin on the Arnhem Highway from a business trip to Ranger 1 at Jabiru, we stopped at a small, unnamed creek not far from the South Alligator Crossing. Just off the road, at the side of the creek, was a large stand of 'paperbarks' and among them two *Cycas armstrongii* each about 12 metres high. Both were hosts to dozens of *D. dicuphym* although none were observed on the surrounding *Melaleuca* sp.

The plants were nearly all facing north where they enjoyed full sun for much of the day. Flowering had been prolific and although a few flowers remained, the inflorescences were carrying hundreds of seed pods. What was remarkable was the fact that all the plants observed were deciduous and not a leaf could be seen. The pseudobulbs which were up to 50cm long on mature specimens gave indications of each having flowered up to five times.

It was interesting to reflect on the environment. The rainfall in this area during the 'Wet' between late November and early May would be about 1250 — 1300mm. From May to November almost drought conditions prevail and a nil recording for three consecutive months is not unusual. During the 'Dry' cloud cover is minimal and daily temperatures range from a maximum of 31° — 32°C to minimums which rarely drop below 20°C. The average mean humidity is about 65%, so apart from a boost from evaporation of adjacent creeks or lagoons, the species survives on its stored moisture in the pseudobulbs. That they survive, grow and multiply in these conditions indicates what a tough and tenacious species they are and belies the theory that orchids are delicate creatures.

D. dicuphum can be a very rewarding species to grow in cultivation and well grown plants with flowers up to 4cm in diameter are not uncommon. Although the type species has near white petals and sepals with a mauve throat in the labellum, a wide range of colour forms are found to occur. While the petals and sepals are normally a near white or may have a very pale pink shading, the throat of the labellum can vary from the 'album' form through pale lemon, yellow, lilac, mauve to a dark mauve/purple which appears almost black. In recent years *D. dicuphum* has been increasingly used as a parent for a number of man made hybrids many of which 'bench' very well. *D.* 'Judy Leroy' (crossed with *D. canaliculatum*) and *D.* 'Chieno' (crossed with *D. discolor*) reflect the excellence of their parentage.

4 Gothic Avenue
STONYFELL, S.A. 5066

August, 1979

Dendrobium dicuphum F. Muell. — photographed by Garry Wells at Berry Springs (40 miles south of Darwin) N.T. (on *Cycas* sp.)

TERRESTRIAL CULTURE NOTES

by L.T. Nesbitt

Spring, glorious Spring is here again. The terrestrials respond to the change in the seasons with a mass of flowers. In this part of the world, Spring brings cold, strong winds with rain and possibly hail followed by warm, breezy days. The cycle of cold front followed by gradually warmer days repeats itself at about 7 day intervals. Temperatures fluctuate wildly from a minimum of 5°C to a maximum of 30°C. Culturally this means moist soil, higher light intensities and good air movement in your growing area. Our most colourful and attractive terrestrials flower in Springtime. Buds develop rapidly and some species such as *Glossodia major* will not open properly or achieve their full glorious colours under poor light conditions. This is very noticeable at the end of a week-long orchid show where the glossodias, which opened at the show in a poorly lit hall, are a pale, insipid mauve and have furled sepals and weak stems.

The majority of Australian terrestrial species flower in Spring. September is the best month to see them in Adelaide. Flowers are about a month later in the nearby Mount Lofty Ranges. The most commonly seen spring flowering greenhoods are *Pterostylis curta* and *P. pedunculata.* Massed displays of these two species are seen every year at the shows in early September. Both species are easy to grow and multiply so rapidly that in a few years the plants become jammed into their pots. The resultant overcrowding does no harm unless an outbreak of rot starts. The rot can spread rapidly from plant to plant. If rotting occurs I pull out affected plants and move the pot to a drier, breezier location. In humid areas it may be necessary to give each plant plenty of room to grow by spacing the tubers at repotting time.

Donkey orchids (Diuris) are the mainstay of terrestrial displays in September. These easily grown orchids with their large 'ears' and bright colours, mostly in the yellows and browns, are reliable in cultivation and most species multiply slowly over the years. The leopard orchid, *Diuris maculata,* which is common in the Eastern States, has up to 10 yellow flowers spotted with brown. Flower shape and colour varies considerably from clone to clone but all are easy to grow and flower every year. *Diuris longifolia* flowers in late September in Adelaide. It has larger, but fewer flowers than *D. maculata. D. longifolia* is very easy to grow and it multiplies readily but can sometimes be shy flowering. It has long, thin, horizontal spaghetti-like tubers which often shoot on both ends to form additional plants. Known by the common names, Donkey orchid or wallflower orchid, it does not flower well the year after repotting. This species can be propagated quickly by repotting every year and separating the clusters of two and three tubers to produce single tubers. However, if you want flowers it is better to leave the pot undisturbed for 4 to 5 years until the vigour of the plants diminishes, then repot in fresh soil. I find that diuris like consistently moist soil in the Winter-Spring period and that they will not grow and flower properly in clay pots under my conditions. Plastic pots of 7-10" diameter give excellent results here in Adelaide. Other good species to try if you can get plants are *Diuris pedunculata* (yellow), *D. punctata* (mauve), *D. sulphurea* (yellow with brown spots), and *D. aurea* (yellow).

Other showy Spring flowering genera are Caladenia and Thelymitra. These plants are not so easy in cultivation, and a bad outbreak of leaf or tuber rot can decimate a collection in a matter of days. They are very attractive and rewarding plants to grow if you can provide conditions to their liking. They seldom multiply vegetatively and because perhaps 10% are lost annually from various causes, it is essential that new plants are raised each year from seed. This is not difficult to do if you have at least one plant. The flowers usually have to be pollinated by hand or seed will not form. The flowers collapse within a few days of pollination and seed pods develop rapidly. Within two months the seed is mature and the pod splits open spilling the dust-like seed into the air. I check seed pods daily in late Spring and pick those that have begun to split. The seed can be sprinkled immediately on top of the pot, or if you intend to repot it, can be stored in paper envelopes for sowing in the Autumn. If more than 2 or 3 pods are set on the multi-flowering sun orchids (Thelymitra), seed pods seem to get preference over the new tuber and weak plants result in the following season. Species such as *Thelymitra aristata* may take 2 or 3 years to recover from a heavy crop of pods. Some of the smaller species set seed on their own and are not weakened excessivly.

Small green leafroller grubs love to eat half developed seed and have a nasty habit of boring into the pods and feasting inside out of sight. Keep a sharp eye open for these critters.

Seedling leaves from earlier sowings should be appearing in numbers from early August. Do not let the soil surface dry out during Spring or these tiny plants will be lost. Additional seedlings continue to appear as the weeks pass, but the late ones do not have time to form tubers before the harsh days of Summer. I ignore seedlings and cease watering when mature plants in a pot have gone dormant. Adult plants of the early flowering greenhoods begin to yellow and go dormant in early October here. Flowering of other species is quickly followed by seed ripening and dormancy in their turn until by the end of November most species have died down. I wait at least a week after top growth has died down before repotting. It helps to allow the pot to dry out completely once plants have gone dormant to dry up all roots and soggy old tubers.

18 Cambridge Street
VALE PARK, S.A. 5081

NEW SUBSCRIPTION ARRANGEMENTS

As from 1st October, 1979 A.N.O.S. Council has entered into an agreement with Business & Commercial Mailing Service Pty. Ltd. (hereinafter called B & C) of 1 Hamilton Street, Sydney (Postal Address: Box 4142 G.P.O., Sydney 2001), whereby B & C will collect all subscription payments and deal with all subscription enquiries on behalf of A.N.O.S.

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Letters to the Editor

DENDROBIUM JOHNSONIAE F. Muell.

In Vol. 6, No. 2 of *The Orchadian* (p. 34) we published a note from S.C. Clemesha to the effect that *Dendrobium johnsoniae* and *D. ophioglossum* should not be considered as Australian natives on existing evidence. In a letter to the editor dated 27 August, 1979, the Rev. Ron Collins of Atherton, Queensland writes: —

"I feel reasonably sure it does not occur in the Cape York area. In New Guinea it grows on casuarinas (occasionally) and mostly on pine trees. I think we have looked on every possible pine tree up there and there is not much casuarina area in temperatures where it would survive, but they have been looked at as well. In fact, I'd be enormously surprised if either it or *D. ophioglossum* were to be found there. Every report of the latter has been investigated and it has always turned out to be *D. smillieae.*"

48 Jack Street
ATHERTON, Qld. 4883

Dear Sir,

Following my article on the Orchids of Lamington National Park I would like to add comments on the walk to Numinbah Lookout from Binna Burra Lodge. This walk encompasses sandstone country reminiscent of Royal National Park near Sydney and is spectacular in its contrast to the rest of the park (it has great views and sandstone rock formations, too). Orchid species seen on one visit to the area are: *Pterostylis parviflora, P. daintreana, P. longifolia, P. pedunculata, Corybas aconitiflorus, Acianthus* sp., *Chiloglottis* sp., *Thelymitra* sp., *Prasophyllum* sp. and a solitary Calochilus dead and withered. Unfortunately a posting to Malaya will prevent my seeing the area in Spring and Summer but it is an excellent (20 km) walk.

PETER VAUGHAN

P.S.: *Flindersia australis* has prickly fruits, but never "stickly" (page 90 of June issue) and I hope everyone else collects under licence and forestry supervision **as we do!**

— P.V.

(Our apologies go to Peter Vaughan for the typesetting error but then his handwriting is not the answer to an Editor's prayer. On the subject of collecting under licence and supervision, it seems that Peter has taken umbrage at certain murmurings provoked by his article on Bonalbo (June issue). — Editor)

Dear Sir,

In reference to Vol. 6, No. 3 of *The Orchadian* — Page 50, comment was made by Mr Bill Murdoch regarding Christmas cards with pictures of Australian orchids.

If for the present the A.N.O.S. Council is not in the position to take up the suggestion, may I then suggest members themselves try out the suggestion by having Kodak Ltd. make the Christmas cards — as they do for people at the end of the year. Just send in your best slide or negative. I am sure the result will be pleasing.

A. STELMACHERS
June 3rd, 1979 **10 Holt St., NETLEY, S.A. 5037**

Dear Sir,

As much as I would have liked to join the Sydney group, ill health has pinned me down somewhat but this is being overcome by degrees. It means I am a lone ranger in a sense as one needs the friendship of like minded interests to deepen one's knowledge in the successful growing of difficult species, away from their natural habitat.

The Orchadian is more than helpful in this area. I like the new approach and set up of the journal and the technical articles, and credit must be given to the present Editor for the excellent work he has done, and the real commitment he has given to this task.

The Editor often asks for small articles but my knowledge is limited, and no worthwhile comments of mine would add to what is already known. One area lacking in my knowledge is field observation, i.e. seeing the different species growing *in situ* this being tied into actual site facing (N, S, E or W) and sun positions throughout the year, with timber cover, wind directions, rainfall, etc. *Dendrobium falcorostrum* is one I find difficult to flower, being tree shaded from mid-day on, but only trial and error will find an answer. Do they want full sun and root exposure ? This one is supposed to be a tree top plant, but of this I have no actual knowledge.

Other areas of interest, in view of the clearing of forests relate to the Society in some ways (I think). Are we Preservationists, or Conservationists and how best orchid plant species can be dispersed to new sites (parks), or new collectors to keep a large stock of plants from actually being destroyed. Nearby Sydney areas of *Dendrobium speciosum* from Bulli back to Warragamba and the dam areas, in some places must be on the clearing out lists, like Kiama and Nowra where I am given to understand they were once plentiful. Maybe I am in ignorance of the true facts. Perhaps local councils should be more aware of what natural plants are in their areas.

Thanks again with best wishes for the progress of the A.N.O.S.

Sincerely yours,
RALPH MADIGAN
78 Edgbaston Road
June, 1979 **BEVERLY HILLS, N.S.W. 2209**

Dear Sir,

For the past twenty five years my wife, children and self have specialised in Terrestrial Orchids, our main interests being collecting and exhibiting in Wild Flower Shows.

Since retirement two years ago I have been active in collecting, photographing and submitting to the W.A. Herbarium the numerous "unidentifiables" that have managed to escape classification for the past 150 years.

As a result of this work it appears that many of our Western Australian species are closer related to the Eastern States Terrestrials than is currently recognised, and that many that we are told by our Herbarium do not occur here, are in fact represented.

I am hoping that through membership in your group I may be able to receive the co-operation necessary to find the correct identification of the numerous plants involved. After many years of endeavour I am convinced that the solution does not lie in this State alone.

I am a member of the W.A. Wildflower Society (Albany Branch), the W.A. Native Orchid Study and Conservation Group and The Australian Orchid Foundation.

Yours sincerely,
RON L. HEBERLE
78 Campbell Road
June 6th, 1979 **ALBANY, W.A. 6330**

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In the Orchadian, Vol. 5, No. 11 (March, 1978) we published a paper by Ben Wallace "On Cryptostylis Pollination and Pseudocopulation". Among references quoted by Mr Wallace were two articles by Warren P. Stoutamire in the American Orchid Society Bulletin — one in 1974 (14 : 13-18) and the other in 1975 (44 : 226-233). These resulted from research done by Professor Stoutamire in Australia with the support of the National Geographic Society and the American Orchid Society. In our December, 1978 issue (Vol. 6, No. 2, p. 45) we published an interim report by Professor Stoutamire on a more recent visit to Australia (December, 1977) in which some of the financial support was given by the Australian Orchid Foundation. His full report on this third study will eventually be published, we understand, in the A.O.S. Bulletin. Meanwhile we have secured the author's permission and that of the A.O.S. Bulletin to reprint the reports of 1974 and 1975. The 1974 report, without illustrations, appears below.

AUSTRALIAN TERRESTRIAL ORCHIDS, THYNNID WASPS, AND PSEUDOCOPULATION

by Warren Stoutamire

In 1927 EDITH COLEMAN began publication of a series of papers in which she described the pollination of *Cryptostylis* orchid species by the males of the ichneumon wasp, *Lissopimpla excelsa* (Published as *L. semipunctata* Kirby). The pollination was effected by insects backing into flowers, probing the column area with the genitalia, and removing pollen masses on the last abdominal segment. When the wasps were allowed to choose between their own females and the orchid flowers, they often chose the latter (Erickson, 1951). This ichneumon species has been reported as the pollinator of *Cryptostylis leptochila, C. subulata, C. enecta* and *C. ovata* (Coleman, 1929, 1930; Watson, 1961; Nicholls, 1969), the first three of which are partially sympatric and flower concurrently. The absence of reported hybrid *Cryptostylis* in mixed populations suggests either a strong internal barrier to hybridization or perhaps to unrecognized physiological races of the wasp, responding to different chemical substances produced by the orchids.

Another orchid genus, *Ophrys,* centered in southern Europe to northern Africa, is well known for its exploitation of hymenopterans by pseudocopulation mechanisms (Correvon and Pouyanne, 1916; Kullenberg, 1961). Pheromones are chemical messengers having a multiplicity of effects, generally considered to be operating between individuals of the same animal species. Specific pheromones involve such things as warning, sexual attraction and caste differentiation. The compounds produced by orchid flowers discussed in this paper all involve sexual attraction of male wasps which serve to pollinate the flowers. The compounds may or may not be chemically similar to the pheromones produced by the female insect. Chemical identification has not yet been attempted either in the thynnid wasps or in the orchids which attract them. Several different orchid genera in the sub-families *Orchidoideae (Ophrys)* and *Neottioideae (Caladenia, Drakaea, Chiloglottis, Cryptostylis)* have independently evolved pheromone-like compounds attracting specific hymenopterans for pollination through attempted mating with the flower — here termed pseudocopulation. In *Ophrys* small bees *(Andrenidae)* and wasps *(Scoliidae)* are the pollen vectors. *Ophrys* and *Cryptostylis* have been the most thoroughly studied orchid genera exhibiting the mechanism to date.

Although the ichneumon wasp *Lissopimpla excelsa* is the well publicized pollinator of *Cryptostylis* orchids, a different and less well documented group of the tiphid wasps (sub-family *Thynninae)* appear to be extensively involved in pseudocopulation in Australian terrestrial orchids. Thynnids are parasitic wasps with winged males and smaller, wingless, often ant-like females. The latter are specialized for digging in the soil in search of insects which the wasp larvae parasitize. The males have the unusual habit of picking up the earth-bound females, mating with them in flight, and visiting flowers where both sexes feed while mating. The briefly mobile female is at once fed and fertilized, before being released for egg laying. This group of wasps is represented by species in a large area including Australia, New Guinea and the Philippines, as well as in tropical America (Riek, 1970).

Several species of Australian terrestrial orchids are pollinated by thynnid wasps, all of them appearing to be sexually attracted to the flowers. I observed the orchids and their visitors during the Australian spring months (September-October), primarily in the Perth-Albany area of Western Australia, with additional observations in Tasmania and New South Wales in early summer (December).

All the observed orchids attracting thynnid wasps have certain characters in common. They lack the bright colours associated with more prosaic pollination systems, with colours running to greenish yellows, browns and maroon. They are odourless to man and all have well developed hair tufts, or groups of multicellular calli, which may be the sites for chemical attractant production. Male insects, detecting the chamical attractant, follow the odour trail to its source. The male wasps pay particular attention to the labellar protuberances. Several of the orchids and the pollinator behaviour are discussed in the following paragraphs. All the orchids are members of the sub-family *Neottioideae,* the only sub-family represented among the indigenous terrestrial orchids of southern Australia.

The "Hammer orchids" (*Drakaea* species) are limited to the south-west of Western Australia and two were observed to be pollinated by male thynnids. The labellum base is a cylindrical claw to which the expanded terminal portion is attached by a flexible joint. The labellum projects more or less horizontally, the position varying in different species, but in all cases the conspicuous, terminal, expanded portion of the lip is maroon in colour and is usually decorated with tufts of calli, glandular protuberances or warty excrescences. The flexible joint makes it possible for the labellum to be carried in an arc to a position in front of the column. Movement is passive and the labellum returns to its original position when released. Observation of the flowers of *Drakaea elastica* reveals a characteristic flight pattern by male wasps *(Zaspilothynnus nigripes)* as they search for the odour source. Cruising males crossing the pheromonal gas stream trailing downwind of the flower begin a back and forth flight pattern, which returns them across the scent trail and upwind toward the area of increasing concentration. The zig-zag flight becomes more direct as the wasp reaches the immediate vicinity of the flower. The insect then locates the labellum, or pseudofemale. The male alights on the decoy, often curving the abdomen and probing the end and sides of the structure. This continues for several seconds and then the wasp grasps the decoy and attempts to carry it away. This lifting action catapults the thynnid and its decoy into the column, with pollen masses being attached to the thorax by stigmatic secretion. Another *Zaspilothynnus* (species undetermined) pollinated *Drakaea glyptodon* in similar manner. I had the experience several times of placing *Drakaea* flowers on the floor behind the seat of my rented car and having thynnids follow the car down the road. The wasps readily entered open car windows and located flowers on the floor. Wasps could often be collected from the inside of the car windows, their exits now being as direct as their entrances. It was sometimes disconcerting to have large black wasps circle my hand as I removed orchid flowers from the car. Their activity usually resulted in my dropping the orchids and retreating to a safe distance the first few times the insects showed such apparent interest in me.

The genus *Caladenia* is a diverse group with more than 40 species in Western Australia alone. Some have bright colours, pleasant odours and generally conventional pollination by small bees in apparent search of pollen or nectar. Several *Caladenia* species do not conform in these characters, however, being odourless to humans, rather dull in colour and specialized for pollination by male thynnid wasps.

The "Dragon orchid", *Caladenia barbarossa,* is one of these. In 1907 O.H. Sargent reported a black wasp making repeated visits to the flowers of the species but either did not recognize what he saw happening or did not wish to admit it in print. The labellum of the dragon orchid is a lobed structure the general size of a female thynnid wasp. It is divided into regions resembling an insect head, thorax and abdomen with leg-like structures extending from the sides. Flowers of *Caladenia barbarossa* are visited by males of *Thynnoides bidens* which fly the same zig-zag search pattern described for *Drakaea* species. The visitor alights on the labellum, curves the abdomen under the tip in probing movements, and then grasps the mobile labellum, attempting to carry it away. As in *Drakaea* species, the wasp is catapulted into the column opposite the labellum and pollen is similarly attached to the thorax by stigmatic secretion.

Flowers of *Caladenia cairnseana,* the "Zebra orchid", function in much the same way when males of an unidentified thynnid visit the flower. Pollen is attached to the wasp thorax as it attempts to remove the decoy from the orchid lip. Wasp visits were so frequent on one hot afternoon that they destroyed several test flowers before adequate photographs could be made.

The large and striking flowers of the "Buttlerfly spider orchid", *Caladenia lobata,* are easily seen in the bush. It is relatively common in the Stirling Mountains area of Western Australia. In this species long filamentous sepals stand erect above the labellum, which is a broadly winged, green-yellow structure deeply fringed on the lateral margins. The maroon labellum tip is recurved and the labellum bears a crest of maroon calli occupying the centre and rear of the structure, which is mobile and rocks back and forth with any disturbance. In this orchid, males of the thynnid wasp species *Thynnoides preissi* and *T. bidens* fly the usual zig-zag, upwind path, alight on the maroon labellum tip and quickly crawl toward the calli lining the labellum base. The initial landing pulls the labellum down, exposing the long calli. As the insect crawls upward on the labellum, the balance changes and labellum plus insect are flipped under the column. Again pollen is attached to the thorax by stigmatic secretion. Flowers are visited repeatedly by male thynnids which often cruise in pairs, one insect following another. These insects appear to develop avoidance reactions after the initial encounter with the flower, subsequent visits being more hesitant and less likely to result in pollination.

Species of the genus *Chiloglottis* are limited in Australia to New South Wales, Victoria and Tasmania, and at least one of these is again pollinated by male thynnid wasps attempting to mate with the flowers. *Chiloglottis gunnii* is a widespread species, the flowers varying from olive green to maroon and with large, shiny calli arranged in several distinct patterns. Near Mole Creek, Tasmania, I observed numerous small orange and black thynnids flying upwind toward flowers, lighting on the dark labellum tips, and crawling under the column toward the large calli at the labellum base. The labellum is attached to the flower by a flexible connection but does not change position as readily as in the *Drakaea* and *Caladenia* species. Wasps removed pollen masses on the thorax as they crawled about under the column, continually probing the labellum tip and sides with extended genitalia. In the native habitats flowers of this race of *Chiloglottis gunnii* open between the two leaves, essentially at ground level. Wasps apparently search for and locate their females at this level, the wasps being confused if the flowers are experimentally raised above their normal ground-level elevation.

Thynnid wasps have also been reported to visit and pollinate species of *Spiculaea* (Rotherham, 1967) and *Calochilus* (Fordham, 1946). The extensive development of pseudocopulation or pseudocopulation-like pollination mechanisms in this array of Australian orchid genera and species is unique in orchid floras. Only the genus *Ophrys* centered in the Mediterranean area contains an equivalent number of similarly pollinated species and all of these are members of a single genus. It is tempting to speculate about the origin of the orchid-thynnid associations in Australian orchids, but until more information is available we can do no more than make educated guesses. The orchid-wasp relationships may have either developed early in species differentiation, orchids and wasps thus coevolving; or the mechanism may have had several independent origins at different times and with already divergent orchid species, as Ames (1937) suggested. Future work is planned and may help to clarify such questions.

The final paragraph of Ames' (1937) paper is worth repeating at this point: —

> "It may be that those who would reject the evolutionary approach to an understanding of life and who prefer to regard the world as the product of Special Creation will lean a little more lightly on human weakness when they discover moral turpitude among the insects. And it may be that entomologists, who see for insect societies parallels in human institutions, will become Freudian in their outlook when discussing the sexual vagaries revealed by symbiotic phenomena and introduce such terms as *Lissopimplan behaviour* or *Ophrydean complex.* Perhaps even the poet will have to reconsider whether 'Only man is vile'."

BIOLOGY DEPARTMENT,
THE UNIVERSITY OF AKRON,
AKRON, OHIO 44325

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REDISCOVERY OF THE UNDERGROUND ORCHID
Rhizanthella gardneri R.S. Rogers

– A.S. George

(Reprinted from the Bulletin of the W.A. Native Orchid Study & Conservation Group (Inc.) for August, 1979.)

On 26th May, 1979 John McGuiness, a farmer at Munglinup, east of Ravensthorpe, turned over a dead tree root and unearthed a specimen of *Rhizanthella gardneri*. It was the sixth such chance finding of this intriguing underground orchid and the first since 1959. Mr McGuiness brought the specimen to the Western Australian Herbarium where its identity was confirmed on 28th May.

On June 1st I visited his property and with the assistance of five enthusiasts located 10 more plants. It was the first opportunity to study their growth habits *in situ* and excavate them. Plants were located by searching for slightly raised, cracked mounds such as are made by fungi before breaking the surface. In eight cases no part of the plant was visible above the ground, but in the other two, where leaf litter had accumulated to a depth of 1 – 2 cm, a small hole about 1 cm across had been formed by the involucral bracts pushing outwards. Although the flowers remained below ground level, the tips of the bracts were slightly above it, whether or not covered by a soil "lid". Further observations by Don Voigt and a subsequent visit on 1st August showed that all the plants eventually developed a hole during flowering.

The orchids occurred in yellow-brown sandy clay. The vegetation was mallee-broombush with *Melaleuca uncinata* the most frequent shrub. As with previous finds the orchids grew close by the bases of the Melaleuca. Mallees included *Eucalyptus redunca, E. spathulata, E. flocktoniae* and *E. pileata.*

The orchids had a horizontal rhizome from 3 to 12 cm below the surface. New lateral rhizomes were developing and it appears that this vegetative propagation gives rise to clones. Two groups each of four plants had apparently formed in this way, although they were no longer connected by living tissue.

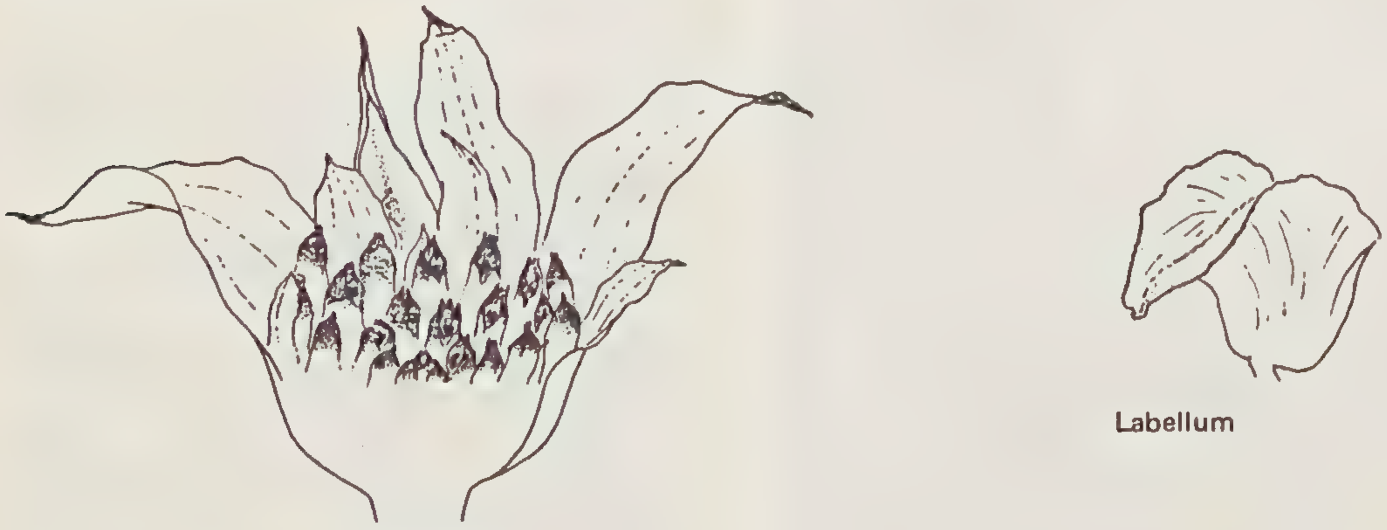
The flowers were deep burgundy with white ovaries, while the bracts were translucent white and rather waxy in texture. A sweet but faint scent, similar to that of *Caladenia aphylla* was produced. No observations on pollination were recorded; perhaps the day was unsuitable, since a strong cold north wind was blowing and the sky was almost overcast.

A further visit to examine the orchids was made on 1st August. By this time the plants had finished flowering. All had developed a hole in the soil surface but had not grown upwards at all. The perianths were withering and the bracts had mostly dried and turned brown. In most cases the ovaries were intact and appeared to be developing further. One plant, however, had been stripped of its flowers while another had died and begun to disintegrate. Although now open to the air, the plants were no easier to locate than when covered with soil, since they blended with the leaf litter. Some sand had also lodged in the heads. A further visit is to be made to collect mature seed.

Mr McGuiness has kindly offered to leave several acres uncleared and fenced when the paddock is prepared for cropping. This will preserve the orchid population for some years, thus permitting further studies to be made.

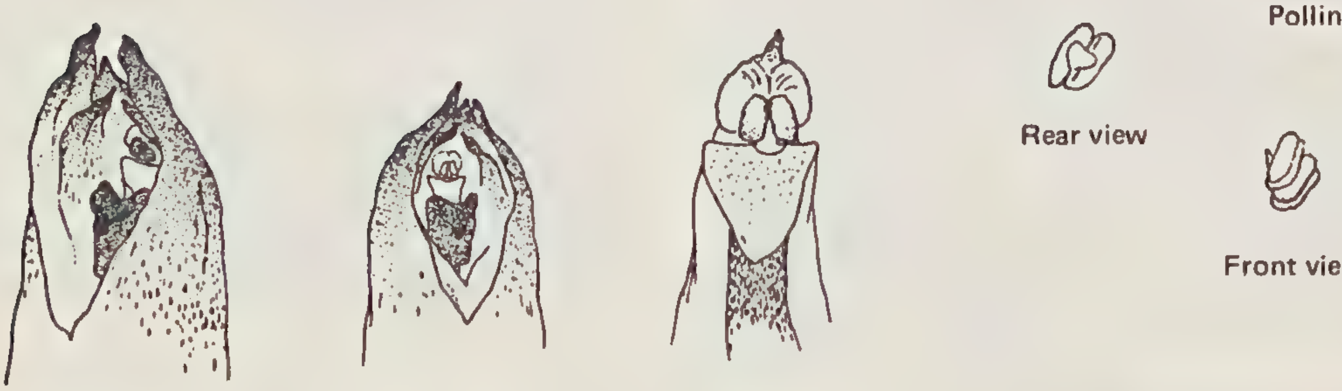
– WEST AUSTRALIAN HERBARIUM

RHIZANTHELLA GARDNERI R.S. Rogers



Labellum

Half flower



Pollinia

Rear view

Front view

Single flower

Single flower

Head of column

DRAWING: Annette Wilson, June 1979

Rhizanthella gardneri R.S. Rogers

— Harold Goldsack *

Corrigin, Shackleton, Goomalling, Munglingup — Western Australia. A new locality where the subterranean orchid *Rhizanthella gardneri* R.S. Rogers has been found, as noted by Don Voigt in his letter to Roy Hargreaves of the Native Orchid Society of South Australia, brings with it hope that, after 50 years, the secret life of the remarkable orchid may be unveiled. It also brings me memories of my first encounter with this plant.

As a young orchid enthusiast I had been collecting for and writing to Dr R.S. Rogers of Adelaide, who at that time was an extremely busy public personality. To my surprise, one day in 1928 I received a note from Dr Rogers inviting me to call at his house in Hutt Street after surgery hours, as he had something to show me which he was sure would be of interest.

Naturally, I took the first opportunity to visit the Doctor, whereupon he brought into the room a large jar with some white vegetable pickled in it. With a smile he said: "Have you ever seen anything like this before?"

Well, there it was. This unique subterranean orchid from Corrigin, Western Australia, sent over by Mr C.A. Gardner, the Government Botanist of Perth, who had realised the importance of this discovery.

The first plants were found in an area of virgin land that had been rolled, burned and then ploughed, which operation uncovered the white underground rhizomes. Mr John Trott, the discoverer, was puzzled by this strange plant growing around the stumps of *Melaleuca uncinata* R.Br., common in the area, and sent it to Mr Gardner. He, realizing the orchidaceous nature of the plant, visited the area, made personal observations and then sent a specimen to Dr Rogers for study which led to the description of a new sub-tribe, genus and species of orchid: *Rhizanthella gardneri* R.S. Rogers. Soon after this the Field Naturalists Section was to hold its Wildflower Show in the Adelaide Town Hall and attempted to have this unique specimen displayed there. However, the plant was too valuable to risk and an artist (Mr Lyall Lush) made a black and white drawing which was exhibited instead.

Within three years, on the east coast of Australia at Bulahdelah, another subterranean orchid, *Cryptanthemis slateri* Rupp, was unearthed. Unearthed is the word, for this one was found by Mr Slater, who was digging up rhizomes of *Dipodium punctatum*, the 'Wild Hyacinth' in an attempt to grow them. All plants of the new orchid were found growing in association with *Dipodium*. The importance of this find was such that Rev. H.M.R. Rupp was given a grant to travel to Bulahdelah to make further studies. This second find aroused world wide interest and a German Botanist suggested that the flowers of *Cryptanthemis slateri* were underground spikes of *Dipodium* The morphology of the flowers soon disproved that theory.

Regarding this orchid, which Rupp named in 1932, Dr Rogers commented to me that he was sure that the Rev. Rupp's parishioners must have had a very brief sermon the week Rupp received the first specimen of *Cryptanthemis* ! Dr Rogers then lamented that the orchid hunter has to add a plough and a pick to his orchid collecting equipment !

16 Livinstone Street
GLENGOWRIE, S.A. 5044

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* **Harold Goldsack** is an active member of The Native Orchid Society of South Australia. Few people in the Australian Orchid World today can claim to have been associates of either Dr R.S. Rogers, Rev. H.M.R. Rupp or W.H. Nicholls, but Mr Goldsack knew them all well. At the request of Dr Rogers he wrote the Orchidaceae Chapter in the Government Publication, now long out of print, called *South Australian National Parks and Reserves* which gave a very detailed description of the flora and fauna of these areas.

Owing to the illness of Dr Rogers prior to his death in 1942, Mr Goldsack, in conjunction with Rupp and Nicholls, did the revision of the Orchidaceae Section of Part 1 of *Black's Flora of South Australia* for the second edition. Dr Rogers had done the original work for Volume 1 in 1922.

In 1978 Harold Goldsack had the distinction of having an orchid named in his honour. This was *Prasophyllum goldsackii* J.Z. Weber and R. Bates, a diminutive species believed to be endemic to South Australia. *(The Orchadian* Vol. 6, No. 1, p. 17).

— J. SIMMONS

COLOUR SLIDES OF
Rhizanthella gardneri R.S. Rogers

A.N.O.S. Council has arranged for copies of 4 colour slide photographs of this unusual orchid to be made available to members at a cost of $5 per set of four. **Closing date for this offer is 31st December, 1979.** Applications to: —
The Secretary, A.N.O.S., P.O. Box C106, Clarence Street, SYDNEY, N.S.W. 2000

Dendrobium convolutum Rolfe

In the recently published book on the Orchids of Papua New Guinea by Mrs A. Millar on page 45, there is a photograph of a pretty green and maroon Dendrobium of the Section *Latouria.*

Whilst at Kew recently, I was able to examine Rolfe's type specimens and have identified this orchid as *Dendrobium convolutum.* The type specimen was sent to Mr R.A. Rolfe, then the orchid botanist at the Royal Botanic Gardens, Kew, by F. Sander & Co. of St. Albans in November 1898. A fragment of the covering letter from Mr Fred Sander is pasted on the type sheet and reads: *"Dendrobium* which we have imported with *Dendrobium atroviolaceum."* This probably means that it was collected in the islands of the Milne Bay Province.

D. convolutum may have a wide distribution in lowland New Guinea, but, as Mrs Millar explains in her book, it has probably been overlooked when not in flower as the plants resemble *Dendrobium bifalce* Lindl. The original description of *D. convolutum* Rolfe was published in the Kew Bulletin (1906) page 375.

T.M. Reeve
Laiagam, Enga Province
October, 1979 Papua New Guinea

On the Correct Spelling of "LATOURIA"

Observant readers will have noticed that the word *Latouria* as used above by Mr Reeve differs in spelling from that used by most botanists and other authoritative writers who use the spelling *Latourea.*

I am informed by Mr Reeve that he recently checked this with Professor R.E. Holttum at Kew and found that Blume in *Rumphia* 4:41, plate 195 (1850) used the name *Latouria spectabilis* for what is now *Dendrobium spectabile.* Later revision of the genus *Dendrobium* resulted in *Latouria* becoming a section of that genus. When Bentham and J.D. Hooker subsequently used the genus name (Gen. Plant. 3:501) in 1883 they applied the spelling *"Latourea".* Other botanists who adopted it included Schlechter and Holttum himself; although some — notably von Mueller — adhered to Blume's *"Latouria".* Mr Reeve has therefore employed the spelling that has precedence in time.

— EDITOR

THE JERVIS BAY ANNEX OF THE NATIONAL BOTANIC GARDENS

We have received a letter from Mr A. Richards, a member of the Committee of Shoalhaven Orchid Society and also of A.N.O.S., seeking publicity and assistance to the staff of the abovenamed Annex in a project to establish native orchid plants in the area concerned. The plants will be placed in inaccessible positions by ladder and the gate to the area will be locked late in the afternoon each day. Although some may feel this will provide an artificial — rather than a natural — habitat for those species that are not native to the area, we publish below a paper and map issued by the National Botanic Gardens in Canberra. For this reason and the conservation aspect, we fully support Mr Richards's request. If you can help either by supplying plants or taking part in the work, please contact Mr A. Richards, 16 Jervis Street, Huskisson, N.S.W. 2540.

The Jervis Bay Annex to the National Botanic Gardens is approximately 78 ha in area. It was originally established in 1951 on about 2 ha of land on the edge of Lake McKenzie, 26 m above sea level. This land had previously been a dairy farm.

The Annex was established to enable the Botanic Gardens to cultivate frost tender plants under more favourable conditions than those which prevail in Canberra. About 1,000 plants from the Botanic Gardens in Canberra are planted out each year. These are usually plants which are being tested for frost tolerance in Canberra and the Annex collection provides a reservoir of propagation material if the plants do not survive Canberra's harsh conditions. In addition to this, increasing numbers of plants are being propagated at the Annex for planting out.

The terrain ranges from relic pockets of rainforest, where many Queensland plants are being established, to low sandstone heath, sand dune and natural swampland.

Several walking trails have been established, one skirting the lake on the southern side and another which provides access to the heath.

The dune vegetation on the south and west side of the lake is dominated by *Eucalyptus pilularis* with *Banksia serrata, Banksia integrifolia* and *Monotoca elliptica* on well drained sandy soils. The more poorly drained parts of the Annex on the eastern side of the lake are dominated by *Eucalyptus racemosa, Eucalyptus gummifera* and *Syncarpia glomulifera*. The heath areas include *Banksia ericifolia, Hakea teretifolia, Sprengelia incarnata* and *Blandfordia nobilis*.

The yearly average rainfall is around 1,170 mm. The wettest month is May and the driest October. Average maximum temperatures range from 24°C — 16°C in January and July and average minimum range is 17°C — 9.5°C in the same months.

Native Orchids in Jervis Bay Territory:

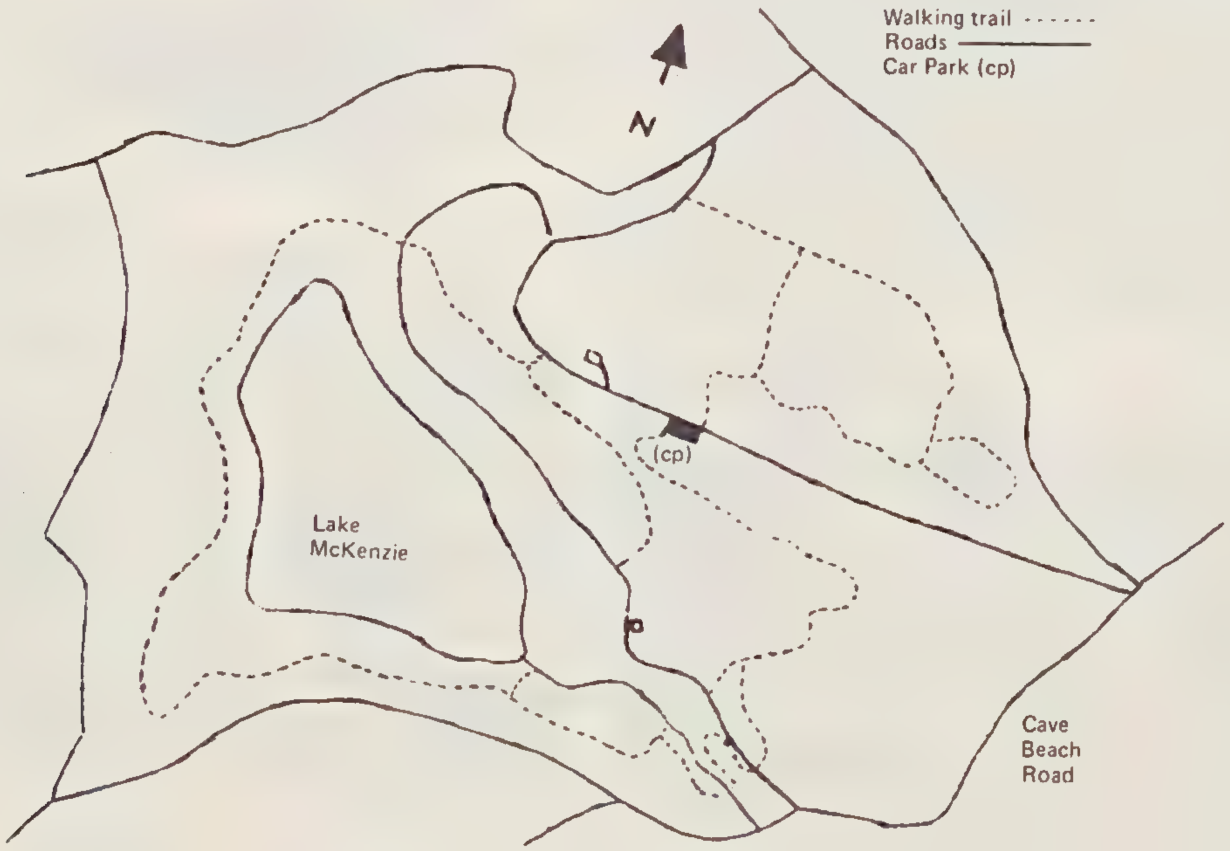
There are only four epiphytes native to Jervis Bay Territory. These are: *Dendrobium speciosum, D. linguiforme, D. teretifolium* and *Cymbidium suave*. Of these *Dendrobium speciosum* is the most common occurring on outcrops of Jervis Bay sandstone throughout the Territory. *Dendrobium linguiforme* occurs in similar locations but is less common. *Dendrobium teretifolium* is found mainly associated with *Casuarina glauca* growing on the foreshores of St. Georges Basin and elsewhere in the Territory. *Cymbidium suave* is usually found in trees, logs and stumps generally in rotted wood. The root system of *Cymbidium suave* is very extensive and will often extend several metres down inside the log or tree in which it is growing.

The terrestrial orchids are much more numerous and include: *Caleana major* — the flying duck orchid, *Dipodium punctatum* — the hyacinth orchid, *Gastrodia sesamoides* — the potato orchid. Other genuses are: *Cryptostylis, Calochilus* and *thelymitra*. A complete list of the terrestrial orchids of the Territory has yet to be compiled.

The NBG annex has very few ephiphytes other than those which occur naturally. This aspect of the annex collection will be remedied as suitable stock becomes available.

The NBG in Canberra has a varied collection of native orchids including the largest collection of native terrestrials in the country. The annex will ultimately benefit from this when stocks reach an overflow point. Many of the orchids which are grown in glasshouses in Canberra could be grown in the open in Jervis Bay as there are many suitable sites and the variety of species grown will only be limited by climatic conditions.

With Australian native orchids becoming increasingly rare in their native state, institutions such as the NBG have an obligation to ensure their conservation.



AUSTRALIAN ORCHID FOUNDATION

Seed Bank

The A.O.F. seed bank is pleased to list the following orchid seed available for distribution. The A.O.F. accepts seed from reputable persons known to it, but neither the Foundation, nor the donors, can guarantee the accuracy of the descriptions.

Applications for seed must be accompanied by payment of $1 Aust. for the first lot plus 50 cents Aust. for each successive lot. All despatches will be made promptly by airmail.

Some holdings of seed are very small and will be distributed on a "first come, first served" basis. Please nominate alternative species. All cheques should be made out to "A.O.F.", and all communications addressed to:

Mr L.J. Lawler, A.O.F. Seed Bank, Department of
Biochemistry, The University of Sydney, N.S.W. 2006

Further details of some samples are available and will be given on despatch.

The A.O.F. is grateful to all the donors of seed, as the success of this venture depends entirely on their generosity.

Australian Species

Bulbophyllum baileyi, B. wadsworthii; Cadetia maideniana; Caladenia dilatata; Calanthe triplicata; Cymbidium canaliculatum, C. canaliculatum v. sparkesii, C. madidum (light and dark forms); *Dendrobium aemulum, D. aemulum* (brush box form), *D. agrostophyllum, D. antennatum, D. baileyi, D. beckleri, D. bifalce, D. bigibbum v. superbum, subv. superbum, D. bigibbum v. compactum, D. cancroides, D. cucumerinum, D. dicuphum, D. discolor, D. gracillimum, D. kingianum, D. linguiforme v. linguiforme, D. linguiforme v. nugentii, D. monophyllum, D. mortii, D. nindii, D. rigidum, D. ruppianum v. magnificum, D. ruppianum v. ruppianum, D. smillieae, D. speciosum, D. speciosum* (large yellow; N.Q. small bulb; Hawkesbury R. form; extreme southern form; almost white, good form), *D. speciosum v. hillii, D. stuartii, D. teretifolium v. teretifolium, D. teretifolium, D. teretifolium* (extreme southern form), *D. tetragonum v. giganteum, D. tetragonum v. tetragonum, D. tozerensis, D. wassellii; Diuris laxiflora D. maculata, D. palustris; Ephemerantha comata; Eria eriaoides, E. queenslandica; Eulophia pulchra; Habenaria ochroleuca; Phaius tancarvilliae; Phalaenopsis amabilis v. rosenstromii; Pomatocalpa macphersonii; Pterostylis cucullata, P. curta, P. nana* (W.A.), *P. nutans; Sarcochilus falcatus, S. fitzgeraldii, S. hillii, S. moorei; Spathoglottis paulinae, Spathoglottis* sp.; *Thelymitra longifolia, T. luteocilum, T. pauciflora* (blue), *T. pauciflora* (white), *T. rubra; Vanda hindsii, V. whiteana.*

AUSTRALIAN ORCHID FOUNDATION

Some Current Projects Under Consideration at 30 June, 1979

1. To produce a new volume to supplement the excellent work by Alick Dockrill in the "Indigenous Orchids of Australia", in conjunction with the Society for Growing Australian Plants.
   The new volume should incorporate all Australian species not listed in Volume 1, and in a format similar to Dockrill's original work. Three years work is expected for this production.

2. To investigate the possibility of producing a pictorial book of all known Australian orchid species, a work which is considered most desirable.

3. Wet season expeditions, specifically for terrestrial orchids if movement during this period can be overcome. These searches are considered most important, and the areas being considered are: (a) the Cape York region, (b) areas in the Northern Territory, (c) the Kimberley Range region.

4. The expedition to the south-east region of Western Australia, the Israelite Bay area in particular. This is an isolated area which has never been surveyed for orchids; August-September, 1980 is being considered for this exercise.

5. To investigate the possibility of publishing Dr R.S. Rogers' work which is held in custody by the Barr Smith Library in Adelaide.
   Dr Rogers work is most important to Australian Orchidology, and whose excellent translations of a considerable portion of Schlechter's work is of world importance and interest.
   Schlechter's papers are written in High German which is not readily translated except by skilled persons with botanical background and knowledge.

6. To consider an application for support by Mr Ben Wallace, Botany Department, University of New England, as a portion of his studies into the compilation of comprehensive flora of the Australian Epiphytes to be delineated and described by means of a floral key to operate on a readily observable vegetative feature wherever possible, and to include information on ecology, distribution, flowering period, etc. of each species.

AUSTRALIAN NATIVES FOR THE TENTH WORLD ORCHID CONFERENCE

Everybody knows by now that the Tenth World Orchid Conference will be held in Durban, South Africa, in September, 1981. Everybody knows, too, that planning well in advance is necessary. What A.N.O.S. members need to know is that, for this Conference, we shall be mounting a specialised display of Australian indigenous species (as distinct from the usual exotic orchids, that are grown as horticultural exhibits in Australia). The Conference will be in the Spring of the southern hemisphere, so we should be able to mount an impressive display — provided early planning begins now. And that is what is happening.

Discussions are taking place between the A.O.C. and Dr M. O'Connor of South Africa concerning Conference plans. Arrangements have been made for Dr O'Connor to address a meeting at the Ryde School of Horticulture, Sydney, at

8 p.m. on 2nd November, 1979

to which **all A.N.O.S. members are invited.** The subject will be: "Orchids of South Africa".

SOME HISTORICAL NOTES ON *Dendrobium nindii* W. Hill

— R.D. Collins

Dalrymple is a name well known to North Queenslanders. George Augustus Frederick Elphingstone Dalrymple is remembered as the man who founded Bowen, as the explorer of the north-eastern coastline, as the man who named Mt. Bartle Frere — Queensland's highest mountain —, as the first member of Parliament for Bowen, the tenth son of a Scottish baronet, and the virtual founder of North Queensland and whose name is commemorated by the large Shire surrounding Charters Towers and by Dalrymple Heights in the Eungella Range behind Mackay.

In 1873 he was the Assistant Gold Commissioner on the Gilbert Diggings and on 1st September he received telegraphic instructions from the Queensland Colonial Secretary to take command of an expedition to examine the coastline from Cardwell to the Endeavour River. The fabulous Palmer Goldfield had just been reported and it was urgent that a suitable port be found as an outlet. He recommended the founding of Cooktown.

He took command of the 12 ton cutter 'Flying Fish' and the ten ton cutter 'Coquette' and to the cheers of the inhabitants of Cardwell he set sail northwards on Michaelmas day (29th September) 1873. The party consisted of 26 men and they carried four months' supplies. Included in the company was Walter Hill, the Government Botanist and the founder (with the enthusiastic assistance of Sir Thomas Bowen, the Governor) of the Brisbane Botanic Gardens. That night the expedition camped on Dunk Island.

It so happened that they were not the only travellers on the island that night. No sooner had the party landed than another boat drew up and anchored. It belonged to Mr P.H. Nind, who was searching for suitable land on which to grow sugar cane. Next day the three boats sailed in company, and two days later they were to drop anchor in Mourilyan Harbour, just south of the present site of Innisfail. Here the Moresby River empties into the sea. It is a small stream and supports mangroves in great profusion, but it was thoroughly investigated, especially by Mr Nind. At its upper reaches the stream branches and the tributory was called Nind Creek.

Just where the stream became too narrow even for a row boat to pass, he espied a large orchid in magnificent full bloom. The quest for sugar land was momentarily laid aside and he gathered that plant to show the government botanist. Walter Hill was delighted. The next year it was described in a Report of the Brisbane Botanic Gardens presented to the Legislative Assembly of Queensland and named *Dendrobium nindii.* The description was in English but was sufficiently detailed to withstand the challenge of the familiar Latin description of F.M. Bailey, who in 1890 named it *Dendrobium tofftii.* Later on, Schlechter roaming the forbidding rain forests of Papua, found it, and in 1912 described it as *Dendrobium ionoglossum.*

It is one of the quirks of chance that it should have been first discovered on the utmost southern boundary of its habitat.

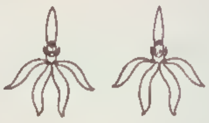
In my estimation, it is Australia's most beautiful orchid. It ranges from Innisfail in North Queensland right through to north-eastern New Guinea.

In Australia it sticks rigidly to the hot, humid environment of the coastal lowlands. It is one of those dendrobiums which demand that its roots be always well drained, but is nourished by the constant humidity produced by a burning sun blazing over water.

Further north in Cape York Peninsula I have seen it growing inland from the coast, but always in association with permanent water. However, in New Guinea, it forsakes the constant sunshine which it seems to require in Australia and is quite happy to grow far removed from the coast, and I have seen it thriving in the dense shade of the rainforest.

Apparently, the high humidity is more important than bright light.

48 Jack Street
ATHERTON, Qld. 4883



NEW AUSTRALIAN ORCHID HYBRIDS

The following recent R.H.S. registrations of new Australian native hybrids have been recorded in the English *Orchid Review* from February, 1979 to August, 1979 inclusive. Comments by the hybridists concerned and by interested readers — i.e. an exchange of experience and opinion — would be very welcome. There seems to be less interest in this field than we anticipated when we began our reports and produced our "Checklist of Australian Native Orchid Hybrids".

It is difficult, of course, to comment if one has not seen a particular hybrid. One can only speculate as to the objective, plan or programme of breeding. From the following list I can offer but one very general observation: that purely Australian hybrids are still not very far from the primary stage. Perhaps our judges can give us the benefit of what they see at the various shows? At the Wollongong Group's Spring Show, 1979, for example, we saw an un-named cross of *D. gracillimum X D. falcorostrum* — a small plant which seemed to hold some promise. Its prime attraction was a very strong yellow colour and a reasonably good shape and size but it had the usual problem of a drooping inflorescence. Perhaps other clones of this cross hold up better?

— EDITOR

HYBRID NAME	PARENTAGE	REGISTERED BY
DENDROBIUM		
Star One	*delicatum* X Star of Gold	V. & N. Jupp (Jan., 1979)
Peewee	*bigibbum X tetragonum*	W. & J. Cannons (April, 1979)
Delicate Falcon	*falcorostrum* X *delicatum*	D.M. Cannon (April, 1979)
Colin	Ellen X *ruppianum* *	W.T. Upton (May—June, 1979)
Double Two	*gracillimum* X *adae*	V. & N. Jupp (May—June, 1979)
Yellow Venture	*speciosum* X *adae*	V. & N. Jupp (May—June, 1979)

* This marks the first occurrence as a parent (in official registrations) of *Dendrobium ruppianum.*

FEEDBACK AND FOLLOW-UP

- **R.D. FitzGerald's** ***Australian Orchids,*** **Volume 2,** after some delay at the binding stage, is now being distributed. The publisher's brochure is enclosed with this issue of *The Orchadian.* The price and discount for A.N.O.S. members are the same as for Volume 1. Those who purchased Volume 1 through A.N.O.S. should place their orders for Volume 2 directly with Lansdowne Editions and ask for the membership discount of $50. New members of A.N.O.S. and others, who did not purchase Volume 1, should post their orders (with cheque made out to "Lansdowne Editions") to the Editor of *The Orchadian* for endorsement as to their membership and transmission to the publisher. Full details of the second volume of this facsimile edition are given in the brochure, where the full-size reproduction of FitzGerald's plate of *Gaieola ledgeri* (now *foliata*) speaks for itself.

- **Reprint of Volume 1 of** ***The Orchadian.*** Owing to the delayed delivery of the June issue with its request for expressions of interest in obtaining such a reprint, it is not yet possible for A.N.O.S. Council to assess the response of members and the economics of reprinting. If you have not yet returned the survey form we sent out with subscription notices, please do so as soon as you can. (See page 86, *The Orchadian,* June, 1979.)

- **The A.N.O.S. Seed Flasking Service** has been terminated. Council has decided, after careful consideration of the problems, that such a service is not viable on a part-time basis. Members may, however, write to our former Secretary, Keith Edwards of 20 Pembroke Street, Cambridge Park, N.S.W. 2750 for information and advice on how to get their flasking done comercially.

- **Annual Membership subscription** is now $7.00 (Australian) and is now overdue. As from 1st October all remittances for subscription renewal and back issues of *The Orchadian* should be posted to A.N.O.S., c/- Business & Commercial Mailing Service, Box 4142 G.P.O., Sydney, 2001.

- **A new Constitution for A.N.O.S.** was adopted unanimously by an Extraordinary General Meeting on 1st September, 1979. The Annual General Meeting on the same date elected the following Council for the year 1979-1980:

President: James Walker
Vice-President: Eric Gordon
Secretary: Dennis De Silva
Asst. Secretary: Mollie Shelley
Treasurer: Ross Calkin
Editor: Joe Betts
Asst. Editor: Peter Weston
Councillors: Phil Collin
Mike Harrison
Fergus Martin

Lloyd Bradford was re-appointed Registrar of A.N.O.S. Judges by the new Council at its September monthly meeting.

- **A.N.O.S. Judges.** Council has approved the appointment of a third Associate Judge to the A.N.O.S. panel. This is James Walker, who qualified at the first training course. See "New A.N.O.S. Judges" on page 70, *The Orchadian* for March, 1979. As yet we have had no response to the request for ideas or comments on the influence of judging standards upon future breeding programmes for horticultural improvement of hybrids and species.

APOLOGY

Back issues

A.N.O.S. Council has reorganised its administration. Accordingly, orders for back issues of *The Orchadian* are temporarily in delay.

The Australian Orchid Foundation Seed Bank

The A.O.F. is charged with action to preserve the orchid species with particular attention to Australian species. As part of its programme it has established a seed bank.

The A.O.F. hopes that the seed bank will make an important contribution to the preservation and propagation of endangered Australian species (and there are many endangered).

To serve its purpose, the bank needs seed. If you are able to provide seed, either selfed or naturally pollinated, your donation to the seed bank will be most welcome. This seed is distributed to interested growers (with a nominal charge to cover administration costs). Your help will be appreciated.

Please direct all enquiries to:

Mr L.J. Lawler
c/- Department of Biochemistry
University of Sydney
SYDNEY, N.S.W. 2006

Telephone: 848 9150 after hours.

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A.N.O.S. PRESIDENT'S REPORT

Ladies & Gentlemen,

It is one of the ironies of life that credit oft goes to those who follow whilst the artificer gets little credit — so I feel it is with me.

A.N.O.S. is presently enjoying a wave of prosperity. We have a new constitution, the "Orchadian" is highly regarded both at home and overseas (which reflects in greater contributions to the "Orchadian") and enthusiasm of the members. During the year correspondence was undertaken in an endeavour to gain for A.N.O.S. the national recognition and representation it deserves — in fact needs. A new group has been formed in the Central Coast District of New South Wales, but we still look forward to our first group in New Zealand.

Proposals are presently before all the Presidents of Groups and Affiliated Societies regarding the granting of a National Award for the best species and the best hybrid orchid. It is anticipated that the scheme will start on 1 March, 1980, however, the details are still to be finalised and a formal announcement is expected to be made in the December, 1979 "Orchadian".

Having said all that I now return to my opening remark. I wish to place credit where credit is due and give acknowledgement to the groundwork done by your past President and present Editor, Joe Betts, for much of this year's achievements lie on the foundations of previous years. Reference has already been made to the excellence and popularity of the "Orchadian". Your Council appreciates the tremendous effort the Editor has put into its production this year.

All Members of Council have worked well with me during the year and without singling out any particular member I wish to thank them all for their hard work and support.

From where I have been sitting, the future of A.N.O.S. looks particularly bright. The "Orchadian" is swelling the ranks of the members and I feel that it is not unreasonable to expect the membership to double in the next three years.

Once again the theme "conservation" seems to be catching the public mind — perhaps not from an active point of view, but rather an awareness of what is in the bush and what is disappearing. The Taronga Zoological Park exercise of the Sydney Group is a case in point. The idea of a permanent orchid display — not unlike others established by most groups — has captured the imagination of N.S.W. Botanists, Dept. of Agriculture, Dept. of Public Works, many members of A.N.O.S. and the Zoo Staff and Zoo Guides themselves. A.N.O.S. and all its groups should be able to look forward to an increased membership from this scheme alone.

Turning now to conservation in the true sense. I appeal to members to do their utmost to protect our native orchids — to discourage the wanton plundering of our private and crown lands, remembering our National Parks are sacred. However, if you become aware that a habitat is to be destroyed for commercial purposes, then I feel we are duty-bound to do all we can within the framework of State Laws, to rescue the plants placed in jeopardy. If only one plant in 100 survives rescue, it is better than letting the 100 be burnt or allowed to rot.

The second side of conservation lies in selective breeding. You hybridists, look to the Hawaiian example and see what was done with *Dendrobium bigibbum.* Let's see more selective selfings and less crosses — the parentage of which somewhat resembles a boiled fruit cake. If this plea is not strong enough, look to how excessive hybridising eventually destroyed the Cymbidium species — not long ago they were very common — now they fetch "impossible" prices at auction. Do we want native orchids to go the same way? Finally, look to the vegetables we eat. We didn't get bigger carrots by crossing little ones with marrows. All the vegetables, fruit, even meat, which we eat today is the result of selective breeding.

By now you have had enough from me, so it only remains for me to wish the incoming committee every success and you, the members, a bright and successful show season. Thank you.

J.A. WALKER
President
1 September, 1979

AUSTRALASIAN NATIVE ORCHID SOCIETY STATEMENT OF FUNDS FOR YEAR ENDING 30/6/79

Opening balance —			
Current	2,522.83		
Fixed deposit	1,500.00	4,022.83	
Plus Receipts		6,999.29	
		11,022.12	
Less Payments		6,933.57	
Closing Balance			4,088.55
Comprising amounts			
held in fixed deposit			1,500.00
available for general business			2,588.55
			4,088.55

P. COLLIN
Hon. Treasurer

STATEMENT OF RECEIPTS AND PAYMENTS

Receipts	1978/79 $	1977/78 $
Membership, subscriptions		
Arrears	100.00	89.00
Current	2,369.00	2,086.00
Advance	414.92	501.00
Bank interest	228.36	186.84
Sale of badges	76.00	58.00
Sale of Orchadians (back issues)	1,102.25	978.65
Sale of Check List	87.95	81.20
Sale of Millar's "Orchids of P/NG"	382.50	—
Sale of Rupp's "Orchids of NSW"	293.80	
Sale of FitzGerald's "Aust.Orchids"	200.00	—
Donations	170.67	81.96
Advertising		
Inserts in Orchadian	56.40	71.50
Adverts in Orchadian	793.00	425.00
Flasking service	124.00	58.00
Sale of ANOS flasks	288.25	81.25
Spring Show	294.19	318.57
Judging course	18.00	414.00
	6,999.29	5,430.97

Payments	1978/79 $	1977/78 $
Printing Orchadian	4,061.25	2,652.68
Preparation of Plates etc.	91.30	
Orchadian — Mailing	209.05	
Orchadian — Postage	248.59	
Printing Constitution	191.00	—
Printing Check List	—	276.00
Printing miscellaneous	150.70	208.57
Purchase of badges	—	14.40
Advertising	40.20	52.20
Insurance	27.40	27.40
Hire of Typewriter	100.00	—
G.P.O. Box	30.00	30.00
Affiliation fees	16.00	16.00
Bank charges	10.00	6.70
Flasking of seed	336.00	—
Schlechter translation	—	148.71
ANOS Show Trophy — Regional Conference	24.80	—
Judging Committee	5.42	—
Judging course	268.39	122.92
Purchase of Millar's "Orchids of P/NG"	373.13	—
Purchase of Rupp's "Orchids of NSW"	350.00	—
Miscellaneous expenses	400.34	339.41
	6,933.57	3,894.99

I have examined the books and records of the Australasian Native Orchid Society and report that the above Statement of Receipts and Payments is in accordance with those books and records.

(P. COLLIN)
Honorary Treasurer

(D. SCOTT-YOUNG)
Honorary Auditor

Who's Who

THE AUSTRALASIAN NATIVE ORCHID SOCIETY OFFICERS AND GROUP CONTACTS:

ANOS Council:

President: J.A. Walker; Vice-President: E. Gordon; Secretary: D. de Silva; Asst. Secretary: Mollie Shelley; Treasurer: R. Calkin; Editor: J.J. Betts; Asst. Editor: P. Weston; Councillors: P. Collin, M. Harrison, F. Martin.

ANOS Group Officers and Affiliated Societies:

NEW SOUTH WALES:

- *Sydney Group:* President: J. Walker (Tel.: 419 2529)
  Meets 8 p.m. 2nd Friday each month, Ryde School of Horticulture, 59 Parkes Street, West Ryde.
- *Warringah Group:* President: E.G. Gordon (Tel.: Business: 764 2215, Home: 939 6726)
  Meets 8 p.m. 2nd Thursday, Stony Range Flora Reserve, Pittwater Road, Dee Why.
- *Newcastle Group:* President: W. Moloney, 11 Crestwood Place, Warners Bay, 2282. Secretary: Mrs Judy Parker, 68 Mills St., Warners Bay, 2282 (Tel. 48 9109). Meets 4th Wednesday, John Young Community Hall, Thomas St., Cardiff.
- *Wollongong and District:* Secretary: Mrs E. Beileiter, 19 London Street, Berkeley, 2506.
  Meets 2nd Tuesday at the Meeting Room of the Wollongong Town Hall.
- *Hastings Valley Group:* Secretary: Mrs N. Blanch, R.M.B. 60, Pappinbarra Road, Beechwood, 2446.
  Meets 7.30 p.m. 4th Friday at Beechwood Methodist Church Hall.
- *Blue Mountains and District Orchid Society (Affiliated):* President: K. Edwards (Tel.: 21 8126); Secretary: M. Wilde, 20 Pembroke Street, Cambridge Park, 2750.
- *Cumberland Orchid Circle (Affiliated):* Secretary: Rayden Rivett, 33 Woodlands Street, Baulkham Hills, 2153 (Tel.: 639 4156). Meets 4th Wednesday.
- *Central Coast Group:* Secretary: Mr Ross Worrell, 6177 Oliver Road, Lisarow, 2251. (Tel.: 24 4435)
  Meets 7.30 p.m. 2nd Wednesday at the Teachers Resource Centre, Georgiana Terrace, Gosford.

VICTORIAN GROUP:

- Secretary: Mrs R. Wootton (Tel.: 754 6585).
  Meets 8 p.m. 1st Friday at the National Herbarium, Royal Botanic Gardens, Melbourne.

QUEENSLAND:

- *Darling Downs Group:* Secretary: Mrs J. Leyden, 66 Mort St., Toowoomba, 4350.
  Meets 7.30 p.m. 3rd Friday at the Auditorium of the Technical & Further Education Centre, Old Empire Theatre, Neil Street, Toowoomba.
- *Native Orchid Society of Queensland (Affiliated):* President: Dr P.S. Lavarack; Secretary: Mrs V. Swaffer, c/- P.O. Box 159, Broadway, QLD. 4000. Meets 8 p.m. 1st Monday at Bread House, 49 Gregory Terrace, Brisbane.

SOUTH AUSTRALIA:

- *Native Orchid Society of South Australia (Affiliated):* Secretary: E.R. Hargreaves, (Tel.: 293 2471 or 297 3724). Meets 4th Tuesday, Goodwood Boys' High School, Hardy Street, Goodwood, Adelaide.
- *Northern & Eastern Districts Orchid Society (Affiliated):* Secretary: W.G. Joffre Keen, 22 Campbell Street, Oaklands Park, South Australia 5046.

WESTERN AUSTRALIA:

- *W.A. Native Orchid Study and Conservation Group (Inc.) (Affiliated):* Committee Member: Ms L. Penny, Unit 6, 63 Fourth Avenue, Mt. Lawley, W.A. 6050.
  Meets 1st Friday at the Department of Agriculture's Film Room, Jarrah Road, South Perth.

NORTHERN TERRITORY:

- *Darwin Orchid Society of N.T. (Affiliated):* President: Mrs R.L. Bromwich; Secretary: Mrs G.C. Heinemann, P.O. Box 38493, Winnellie, N.T. 5789.

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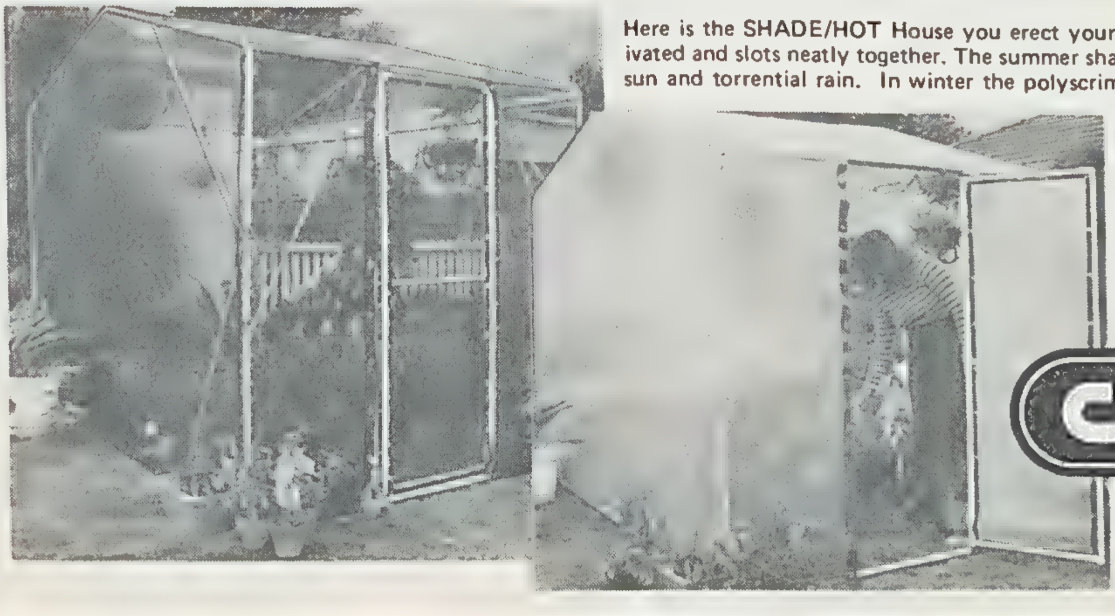

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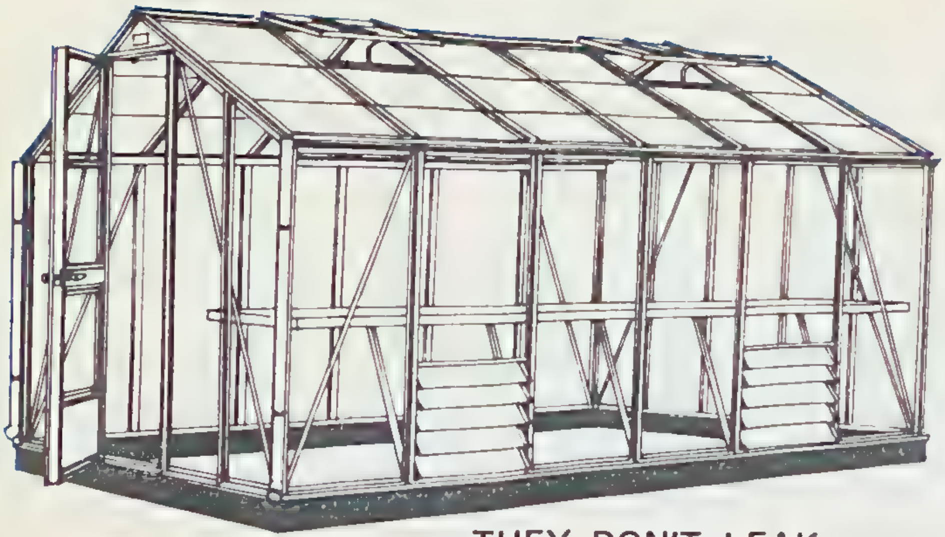

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The Orchadian

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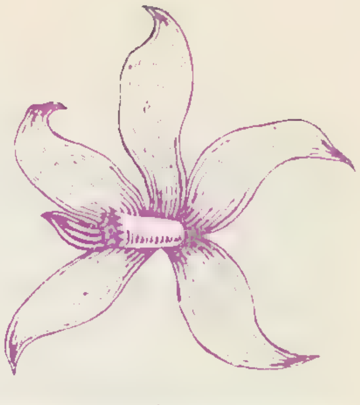

Dipodium punctatum (J.E.Sm.) R.Br.

DECEMBER, 1979

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Officers of A.N.O.S. Council:
President: J.A. Walker
Secretary: D. de Silva
Treasurer: R. Calkin

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Articles should be typed in duplicate preferably on A4 size paper; double spaced with 4 cm or more lefthand margins.

A.N.O.S. Annual Membership is $7.00 which includes family membership and covers four issues of this journal.

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- Darling Downs (Qld.)
- Victoria
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Affiliated Societies
- Blue Mountains & District O.S. (NSW)
- Native O.S. of Queensland
- Native O.S. of South Australia
- W.A. Native Orchid Study & Conservation Group (Inc.)
- O.S. of Northern Territory
- Others are listed by States inside the back cover.
- Societies may affiliate by subscribing to *The Orchadian* — which includes membership of A.N.O.S.

Date this issue distributed:
11th December, 1979

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IN STORE

- *Dendrobium antennatum* Lindl. in Australia.
- Three new orchids from North Queensland to be described.
- New Guinea dendrobiums — a key to the section oxyglossum.
- Two scientific papers — one on the pH factor in media and the other on the chemistry of colour in orchids.
- A review of awards for Australian orchids.
- Australian native orchid hybrids photographs by P. Collin and a paper by Roger Bedford.

Back Issues of *The Orchadian* are available from the Secretary at $10 (Aust.) per volume. Within Australia add postage charge of 80 cents per volume. For overseas postage by surface mail, plus packing, add $2 (Aust.) per volume. At present Vol's. 2 to 5 only are available, each volume comprising 12 unbound issues. Single copies are at $1 (Aust.) each (plus postage 35 cents).
If sufficient orders are received for Vol. 1 reprinting may be possible. Please let us know without delay.

SUBSCRIPTIONS FOR 1979/80: Subscribers who have not yet paid their dues for the current year to June, 1980 will not receive the issue for March, 1980.
MAKE SURE THIS IS NOT YOUR LAST ISSUE !

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THE ORCHADIAN

Founded August, 1963

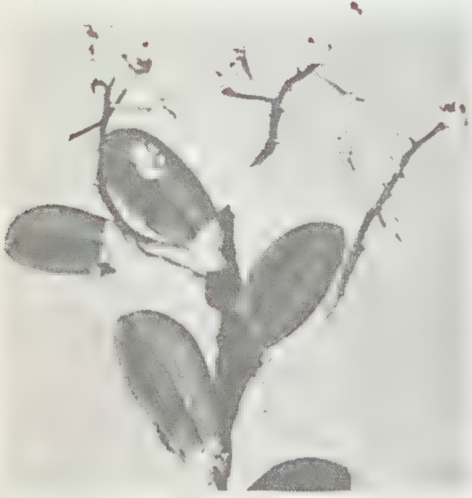
Editor: J.J. Betts
Honorary Associate Editors: Dr N.J. Grundon (Qld.), Mr J. Simmons (S.A.)

Volume 6 December, 1979 No. 6

EDITORIAL

This issue of *The Orchadian* brings us not only to the end of another calendar year and to the festive season, but also to the half-way mark in Volume 6. Looking back over the contents of its first six issues, one notices certain trends: A steady flow of articles from New Zealand; a great deal from Papua New Guinea (direct from two field-workers on what might be called the world's most fruitful frontier of orchid discovery); an increased proportion of articles on cultivation techniques including terrestrial orchid culture; a leavening of scientific contributions; a little on the vexed problem of conservation; book reviews that are truly critical; controversial taxonomic reviews; and now a new species described — not unexpectedly — from Papua New Guinea. What do these trends show ? I suggest they show that orchidology is very much alive in Australasia and there is every indication that it will continue so. A.N.O.S. is still growing fast in membership numbers. May it continue to grow, as our contributors maintain the standards they have set in these past six issues. We all wish them the very best for the New Year.

Possibly the editorial page is most in need of brightening up. So we introduce a picture this time — albeit a mysterious one. Looking at this captionless figure from the camera of Phil Collin and the studio of our official photographer, Garry Wells, how would you classify it?



(For more details see pp. 141—142.)

FEEDBACK & FOLLOW-UP:

- **Readers' Information Exchange.** This was suggested as a follow-up of Erhard Husted's "open letter to the Editor" in the June issue, 1979. Mr Husted tells me there has been no response to date. He believes this is because many are either shy or afraid of being cried down by more experienced readers. Perhaps this is so but when discussion time comes up at Group meetings quite a number of people join in *verbal* exchanges of really valuable information without signs of shyness or fear of contradiction. It must be the terrible finality of the written word. Once you have written it, you cannot, as Omar Khayyam said, "lure it back to cancel half a line, nor all thy tears wash out a word of it". As against this I would remind you that by writing it down you will sharpen up your own ideas and may even improve nor change them. As Francis Bacon said: *"Writing makyth an exact man."*
- **Awards for Australian Native Orchids.** What chance do our natives have? This question is so often asked rhetorically — implying lack of hope. Sometimes the gloomy answer is given as "Never more than a Cultural Certificate". Perhaps the times are a-changing. Here are some results of the 1979 Spring flowering:

Award No.:		Owner:
1011	Den. Bardo Rose 'Teresa' HCC/OSNSW	C. Brandon (16/9/79)
1012	*D. speciosum* 'National White' HCC/OSNSW	C. Brandon (16/9/79)
1013	*D. kingianum* 'Bungan Castle' AM/OSNSW	E. Webeck (16/9/79)
1017	*Sarcochilus hartmannii* 'Kerri' AM/OSNSW	J. Williams (4/10/79)

A.N.O.S. member David Banks will give us a complete review of past Awards for Australian Native Orchids in our next issue.

PRACTICAL PARTICIPATION

in the Tenth World Orchid Conference, Durban.

One of the disappointing aspects of the 9th World Orchid Conference held in Bangkok in 1978 was the total absence of any display of Australian Native Orchids despite a large participation and involvement of Australians at the Conference.

Earlier this year, it was suggested to the A.N.O.S. Council that an effort should be made to ensure that a display of both native terrestrials and epiphytes would be a feature of the 10th World Orchid Conference to be held in Durban in September, 1981. It was further suggested that the affiliated Societies and groups in W.A., S.A. and Victoria could be responsible for terrestrials, while those in N.S.W. and Qld. could handle the epiphytes. Plans could be coordinated by A.N.O.S. Council.

Fortunately, the fact that Durban is in our hemisphere, enjoys a temperate climate and the Conference is being held in September are major factors favourable to the project.

As it would be rather impractical to ship potted terrestrials to Durban, we had suggested sending tubers in December 1980 for cultivation by host members in South Africa — particularly those species which flower in the August/October period.

During his visit to Adelaide in October we discussed the concept of the scheme with Dr Michael O'Connor of Pietermaritzburg, who was touring Australia as Publicity Officer for the 10th World Orchid Conference.

Dr O'Connor was most enthusiastic regarding the project and offered the full co-operation of his fellow South African Members. From his discussion with N.O.S.S.A. Committee Members in Adelaide we have arranged a 'Pilot Scheme' to send a shipment of tubers with detailed cultural instructions to Dr O'Connor in December, 1979. This is expected to prove the feasibility and practicability of the scheme. Dr O'Connor is arranging the necessary Import Licence and we do not anticipate any problem in meeting the South African requirements in this respect.

Would any Members wishing to contribute tubers and participate, get in touch with Les Nesbitt, Reg Shooter or the writer.

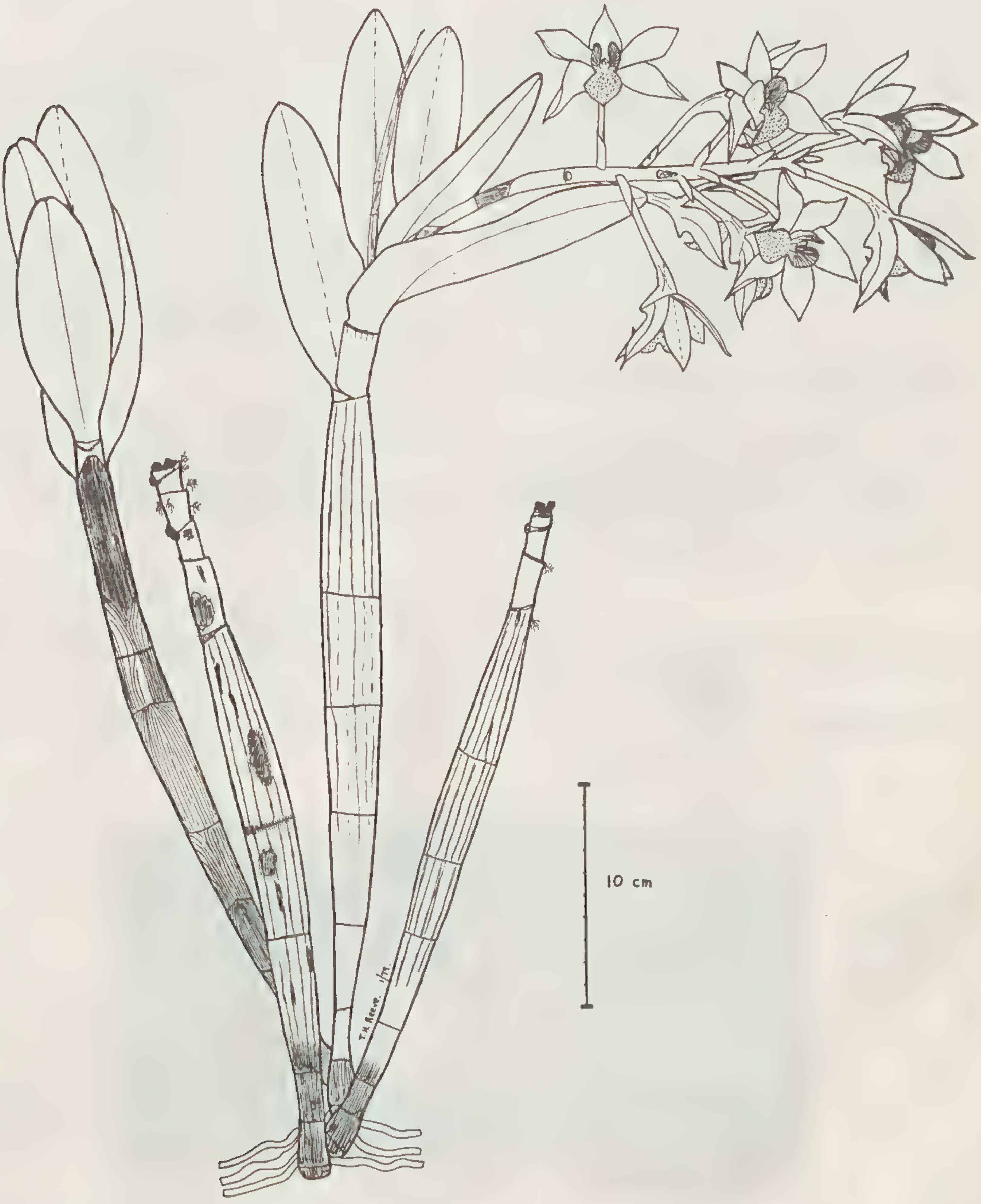
J.T. SIMMONS
4 GOTHIC AVENUE
STONYFELL, S.A. 5066

THE FLORAL EMBLEM OF THE ENGA PROVINCE, PAPUA NEW GUINEA

by T.M. Reeve

Dendrobium engae sp. nov.

In 1978 a showy section *Latouria* orchid, growing in the mountains of the Enga Province, Papua New Guinea, was chosen as the emblem of that province. Previously known as "Pike's Special", this orchid is here described as a new species, together with notes on its habitat, distribution, flowering and cultivation.



Part of the type plant in cultivation at the
Highland Orchid Collection, D.P.I., Laiagam.

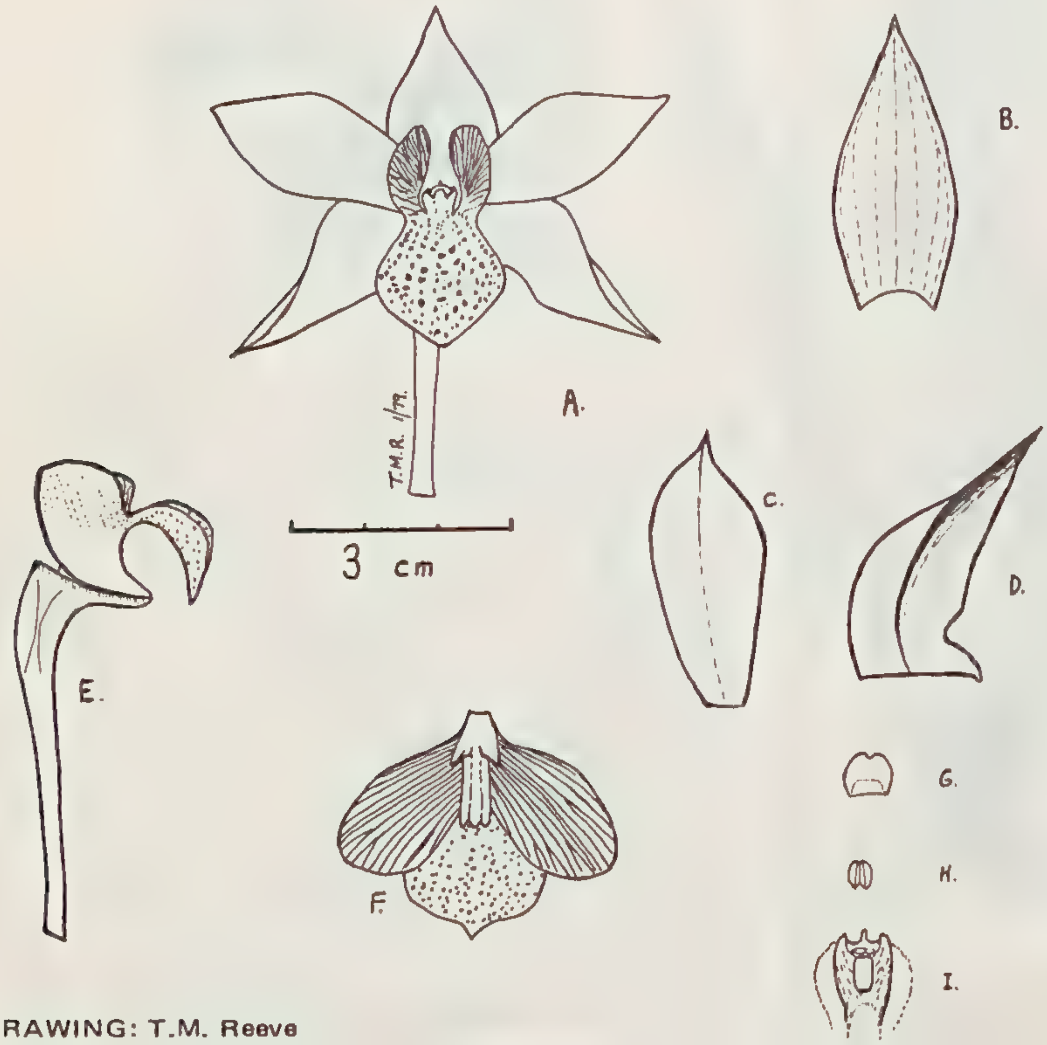
DENDROBIUM ENGAE T.M. Reeve

Dendrobium engae T.M. Reeve sp. nov. a ceteris speciebus montanis grandifloris sectionis *Latouriae* floribus omnino glabris, labello purpureo-notato distincte facile distinguendum.

Herba epiphytica, robusta, usque 60cm alta; *rhizomate* brevissimo; *radicibus* incrassatis, flexuosis, rugulosis, 2–4mm diametro; *pseudobulbis* crassis fusiformibus sed basi leviter tumidis, longitudinaliter sulcatis, c. 10 — nodis, 3–50 x 1.9–3.3cm, apice folia 3–5 ferentibus; *foliis* erectis usque semierectis, oblongo-ovatis vel oblongo-ellipticis, acutis interdum emarginatis, glabris, coriaceis, 5.5 — 21 x 2.5 — 6cm; *inflorescentia* terminali vel subterminali, 3-15-flora; *pedunculo* 4–9cm longo; *rhachide* 4–13cm longo; *bracteis* ovatis, acuminatis, c. 1.5cm longo; *floribus* magnis, carnosis, glabris, late aperientibus, 5–6cm diametro, valde suaveolentibus; *tepalis* viride-albis cremilutentibus; *sepalo dorsali* ovato-triangulari, acuto, 4 — 4.5 x 1.7cm; *sepalis lateralibus* oblique ovato-triangularibus, falcatis, acuminatis, valde carinatis, 3.8 — 4.1 x 1.6cm, ad basi pedi columnae per 1.0cm adnatis; *petalis* obovato-spathulatis, acutis, 3.7 — 4.5 x 1.6 — 1.7cm; *labello* valde articulato, trilobato, rigido, 3.8 — 4.5 x 3.5 — 3.8cm, callo longitudinali tricarinato; lobis lateralibus erectis columnam cingentibus, oblique oblongis, obtusis, 1.7 — 2 x 1.2 — 1.5cm, pallide lutei - brunneis, intus distincte purpurei - striatis, extra sparsim purpurei - punctatis; lobo medio porrecto decurvato, rotundo - reniformi, acuto vel apiculato, 1.8 — 2cm diametro, viride - luteo, aetate magis lutescente, punctis multis purpureis notato; *columna* c. 0.6cm longo, alba, purpureo - punctata, pedi c. 1.0cm longo; polliniis 4 aureis; *ovario* 6 - sulcato, carnoso, glabro; pedicello cum ovario c. 4.7cm longo.

Robust, epiphytic herbs up to 60cm tall. Rhizome extremely short. *Roots* thick, flexuous, glabrous with rough surface, 2 — 4mm diameter. *Pseudobulbs* thick, slightly swollen at the base, fusiform (small plants have ovoid stems), becoming vertically grooved with age, yellowish, approx. 10 nodes, 3 — 50 x 1.9 — 3.3cm, with 3 — 5 leaves at the apex. *Leaves* erect to semi-erect, oblong - ovate to oblong - elliptic, acute sometimes emarginate, glabrous, leathery, pale to medium green, 5.5 — 21 x 2.5 — 6cm. *Inflorescences* terminal or subterminal, 3 — 15 flowered, peduncle 4 — 9cm long, rhachis 4 — 13cm long. *Bracts* ovate, acuminate, approx. 1.5cm long. *Flowers* large, fleshy, glabrous, widely-opening, approx. 5 — 6cm diameter, strongly and sweetly scented, sepals creamy-white petals greenish-white, tepals becoming creamy-yellow with age. *Dorsal sepal* ovate - triangular, acute, 4.0 — 4.5 x 1.7cm. *Lateral sepals* obliquely ovate-triangular, falcate, acuminate, strongly keeled, 3.8 — 4.1 x 1.6cm, base adnate with the column foot for approx. 1.0cm. *Petals* obovate - spathulate, acute, 3.7 — 4.5 x 1.6 — 1.7cm. *Labellum* strongly hinged, 3-lobed, stiff, with prominent 3-keeled white median callus; expanded (flattened) measurements 3.8 — 4.5 x 3.5 — 3.8cm. Lateral lobes erect surrounding the column, oblique - oblong, obtuse, pale yellow-brown with distinct purple striations on the inside and some small dots on the outside, 1.7 — 2.0 x 1.2 — 1.5cm. Mid-lobe projecting forwards and downwards, rotund to reniform, acute to apiculate, greenish-yellow becoming more yellow with age with many scattered purple dots, approx. 1.8 — 2.0cm diameter. *Column* typical of the section, white with some purple dots, approx. 0.6cm long, column foot approx. 1.0cm long. Pollinia 4, golden yellow. *Ovary* thick, fleshy, glabrous, 6 - grooved, ovary with pedicel approx. 4.7cm long.

Holotype: T.M. Reeve 238 in LAE. *Isotype* in Kew.
Ipai, Laiagam. 2200m. Oct. 1978.
Paratypes: NGF 43904 (D. Feist for J.S. Womersley) in LAE, Leiden, Kew. Wabag 2200m. Feb. 1972.
T.M. Reeve 180 in LAE. Wabag 2400m. Nov. 1977.
Enga Name: "Tsei" (a general name for epiphytic orchids).



DENDROBIUM ENGAE sp. nov.

FLOWER
A Front view
B Dorsal sepal
C Petal
D Lateral sepal
E Pedicel / ovary / labellum
F Labellum — flattened
G Anther
H Pollinia
I Column[
A — F to indicate scale,
G, H, I to scale X 2.

DRAWING: T.M. Reeve

Dendrobium engae is readily distinguished from other large-flowered montane species of section *Latouria* by the entirely glabrous flowers, the unspotted creamy-white tepals and the distinctive markings of the labellum. Even when not in flower, mature plants are quite easily recognised by the shape and colour of the pseudobulbs and leaves. The flowers are strongly and sweetly scented and sometimes in the field the flowers can be smelled before they are seen. As a matter of interest, strong scents have been recorded for some other members of section *Latouria* including *D. atroviolaceum* Rolfe, *D. hodgkinsoni* Rolfe and *D. forbesii* Ridl.

According to Mr Y. Meredith of Sydney, the existence of this species in the Enga has been known to the outside world since the 1950's, but apparently plants were first sent to the Division of Botany, Department of Forests, Lae, in the mid 1960's by Dr K. Pike, a medical officer in Wabag. From that time the species was nicknamed as "Pike's Special". Little was known except that it was a beautiful orchid only recorded from near Wabag, then a remote outstation in the former Western Highlands District. At that time no Highland gardens existed where the mountain orchids could be cultivated and studied.

In 1973, the Enga Division, containing the biggest language group in Papua New Guinea, was separated from the Western Highlands to form the Enga District to be administered from Wabag. This separate District included the Government stations of Wabag, Wapenamanda, Kompiam, Laiagam, Kandep and Porgera. With further developments the Enga Provincial Government was inaugurated on the 2nd October, 1978. Prior to that, in late 1977 and early 1978, a competition was conducted for a flag and seal for the Enga Province. Mr J. Gordon-Kirkby, a District Officer at Wabag with some artistic talent, prepared a design in which a partly stylised representation of *D. engae* was depicted in the centre of the flag. This design won the competition and the flower has become known to the local people and visitors as the Enga orchid. Being verified as previously undescribed, the opportunity existed to give this orchid an appropriate and short name – *Dendrobium engae*.

HABITAT: *D. engae* is commonly found growing high up on the branches of *Nothofagus* (Beech) trees at an altitude of 2000 to 2700 metres above sea level. It prefers to grow where there is plenty of light, so it is usually found on the forest edges or on small or sparse stands of *Nothofagus* which are common amongst the hilly gardening land of the Enga people. The beech timber is highly prized by the Engas for use in construction of houses and fences, and will not usually be chopped down unless needed for that purpose. The beech forests are left standing and young trees are also carefully preserved, whereas most of the other tree species may be cleared when further gardening land is required. This "conservation" should ensure the preservation of *D. engae*. Also, the majority of plants are out of reach to all except the agile climber.

DISTRIBUTION: *D. engae* is found from Laiagam to Wapenamanda in the Enga Province and, so far, this is the only area where this species has been found growing plentifully. A few plants have been recorded from other provinces by the following collectors: Western Highlands (Mr P. Sausman); Eastern Highlands (Mr V.A. Chadim, Rev. N.E.G. Cruttwell) and Morobe Province (Mr N.H.S. Howcroft). I have also collected it in the Chimbu Province and in the Goilala District of the Central Province, Papua. Because of its protected habitat it may have escaped the attention of collectors in the past or may have been seen without flowers. It probably has a wide distribution throughout New Guinea.

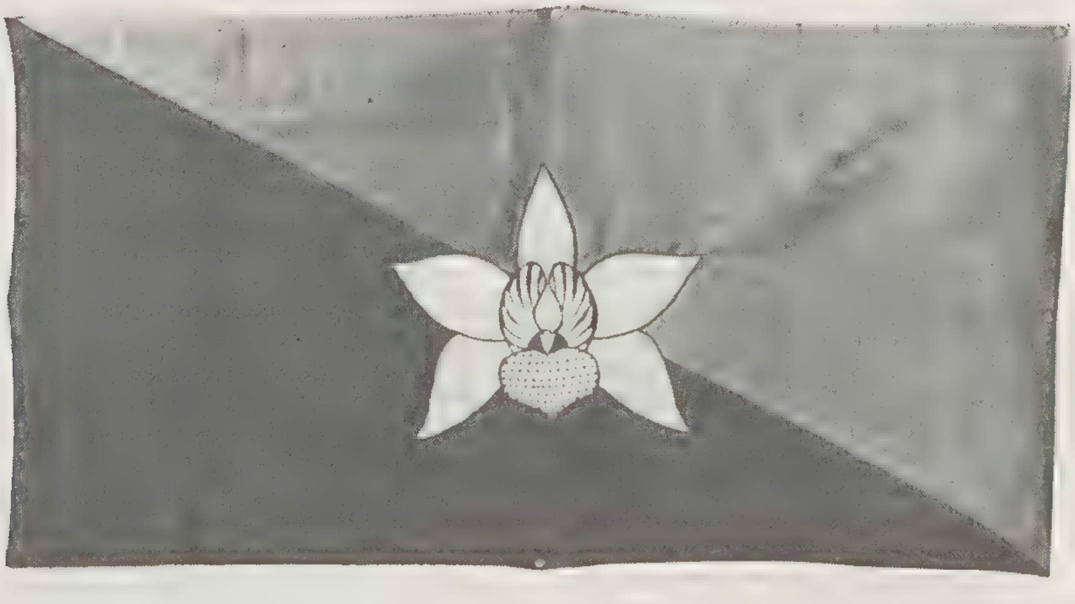
FLOWERING: Plants have been recorded in flower at most times of the year but the main period of flowering has been observed from October to April. Flowers last up to 10 weeks if not pollinated. Being a large flower, widely opening, with a colourful contrast between the nicely marked labellum and the creamy-white tepals, this is a handsome species. It should make a good parent in hybridising programmes. In nature, the fragrant flowers attract many insects and are often quickly pollinated. The seed pods take about six months to mature.

CULTIVATION: *D. engae* is a light-loving species and is very sensitive to over-watering and poor drainage. No doubt some breeze or good air circulation is an important factor in growing this species. It does well at Laiagam on beech posts and on slabs of tree-fern, as well as in pots and baskets with a coarse mixture of washed pine bark *(Pinus patula)* and charcoal. *Nothofagus* bark has also been tried with success. The plants prefer the full morning sun or a constant 30% shade at Laiagam. The high altitude climate of New Guinea is notoriously difficult to duplicate, and intending growers may do best to wait until selected seedlings become commercially available.

Acknowledgements:

I wish to thank Dr P.J. Cribb of the Royal Botanic Gardens, Kew, for preparing the Latin description, and those persons mentioned in the article for providing information on this species.

Laiagam, Enga Province
September, 1979 **PAPUA NEW GUINEA**



THE ENGA PROVINCE FLAG: The upper part of the flag is green, whilst the lower segment is black. The stylised flower is depicted in black and white, except for the three sepals, which are coloured yellow.

PSEUDOCOPULATION IN AUSTRALIAN TERRESTRIAL ORCHIDS

by Warren Stoutamire*

One of the outstanding features of orchid flowers is the variety in form and function. One pollination mechanism which is not known outside the Orchidaceae is that of pseudocopulation — the chemical and often physical resemblance of a flower to that of a female insect. Pseudocopulation has been demonstrated in the Mediterranean-centered genus *Ophrys* of the sub-family Orchidoideae, in the South American *Trichoceros* (Dodson 1962) of the sub-family Epidendroideae, and in several Australian genera of the Neottioideae. This array of distantly related orchids with similar pollination mechanisms on three continents introduces questions of how the mechanisms arise and why they are limited to the Orchidaceae.

Insect sexual attractants (sex pheromones) are highly specific for the species producing them, female insects attracting only males of their kind. Early work with the *Ophrys* orchids seemed to indicate that one insect species was the major pollinator for each orchid species although other insect species may also act as pollinators in some cases (see Proctor & Yeo 1973 for discussion). An exception to this essentially 1:1 species relationship occurs in the Australian orchid genus *Cryptostylis* in which one wasp species pollinates at least four of the orchid species — one in Western Australia and three in the eastern states. One wonders whether the 1:1 system and the promiscuous *Cryptostylis* system are the only variants of pseydocopulation mechanisms; Australian field work suggests that these are not the only alternatives. Field surveys conducted in the Australian spring months of September-December in 1972 and 1973 have added new species to the pseudocopulation records as well as indicating greater variety in the mechanisms.

A promiscuous system such as that in *Cryptostylis* can function only if there are strong barriers to hybridization; otherwise species would cross extensively in areas of overlapping distribution. No hybrids have been reported in the genus in Australia, suggesting that barriers do in fact exist. Three species, *C. subulata, C. leptochila* and *C. erecta* (Figures A, B and G) are sympatric in the vicinity of Sydney, flowering concurrently in at least one site. Bait flowers of the three species were presented in local bushland and *Lissopimpla excelsa* wasps visited the bait. Wasps often indicated a preference for one flower over another. This may be due, perhaps, to differing pheromone production, which may be influenced by flower age, time of day, or some other factor, but individual wasps were observed several times to visit a preferred flower of one species and then approach flowers of another species.

Occasionally wasps were observed bringing in pollinaria from local but unseen *Cryptostylis* flowers. None carried two pollinaria nor did any remove a second pollinarium from the bait flowers visited. A mechanical barrier may function in which the first pollinarium attached to the insect reduces the chances of a second attachment. If this interference occurs in mixed orchid populations where one species predominates, the pollinaria of the dominant orchid species would have the greatest chance of transport by the available wasp population. The successful fertilization of the less common species would be reduced through competition for pollinators and mixed orchid populations would be selected against. Such a mechanical control would be significant only if the orchid species sharing the common pollinator flowered concurrently — the situation in *Cryptostylis.* Mechanical interference such as this would be unnecessary if *Cryptostylis* flowering periods were not simultaneous and one might, therefore, expect selection for a greater spread in flowering season. The timing of *Lissopimpla* wasp emergence and of the growth cycles of *Cryptostylis* species could both counteract this, however.

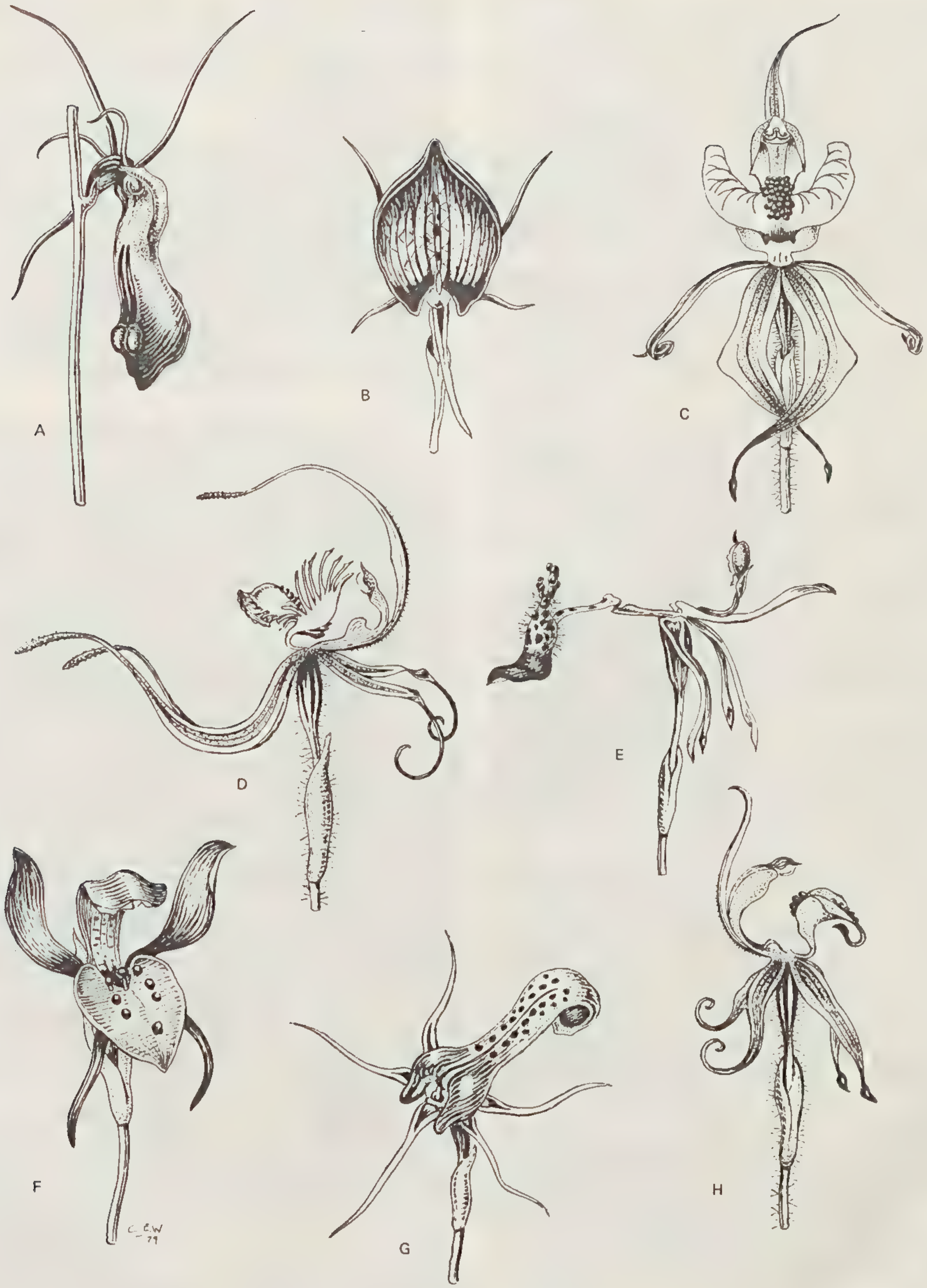
Factors other than mechanical interference may be responsible for reproductive isolation of the *Cryptostylis* species. Steve Clemesha and I made experimental crosses in order to determine whether internal barriers to hybridization exist. The sympatric species were experimentally crossed in all combinations and attempts were made to cross different clones within each species and compare the results with selfing within the clone. Although the results are incomplete there is an indication that strong internal barriers prevent hybridization of the species. Mature embryos were produced only in interclonal combination, failing in selfing and interspecific combinations. It appears that the species cannot hybridize, even if wasps visit two or more species in succession. Pollen massulae will be lost during illegitimate visits, but sufficient pollen remains on the pollinarium for legitimate pollinations of later-visited flowers.

Lissopimpla excelsa wasps (family Ichneumonidae) are distinctive in form and in behaviour; they are easily recognized in the bush, and there is no question that this one species is being utilized by several orchids. Such is not the case in the group of orchids attracting wasps in the family Tiphiidae, subfamily Thynninae. The taxonomy of the orchid-visiting thynnid wasps is incomplete and several of the wasp species encountered in field work are identified tentatively. Species of the related family Scoliidae are also involved in pseudocopulation with Australian orchids (Jones and Gray 1974) and this wasp family is represented among Mediterranean *Ophrys* pollinators. Scolliids pollinate *Calochilus* orchids in the eastern Australian states although some races of the species have developed effective self pollination mechanisms as well.

Thynnid wasps are the pollinators of several *Chiloglottis* orchids and within this genus there is not always a simple 1:1 relationship between orchid and wasp species. *Chiloglottis gunnii* (Figure F) can be used as an example. The species is geographically widespread, ranging from New South Wales through Victoria to Tasmania. Geographic races differ in peduncle length, flower colour and position of calli. Flowers of the race occurring on Mount Roland, Tasmania, were visited only by an *Eirone* wasp species in 1972 and 1973. This is not the only wasp visitor to the various *Chiloglottis gunnii* races, however. When flowers of several races were used as bait I found that the *Eirone* visited only the Mount Roland race, while two morphologically differentiated races in Mount Field National Park, Tasmania, and another race in the Snowy Range of New South Wales each attracted different wasps. The two races of *Chiloglottis gunnii* in Mount Field flower concurrently with another species, *C. cornuta.* The latter was not observed to attract any insect and appears to be self pollinating. Self pollination is also known in species of the Australian orchid genera *Thelymitra* and the previously mentioned *Calochilus.* Although *Chiloglottis cornuta* has well-developed calli on the labellum, these appear to be non-functional. The calli of *Chiloglottis gunni* races are active sites for pheromone production. When calli are clipped from the flowers and dropped on the forest floor, wasps find individual glands and investigate them with apparent excitement.

The three biological entities flowering within feet of each other at Mount Field are reproductively isolated, one apparently by self pollination and the other two by selective attraction of different wasps. The latter two fall within the taxonomic-morphological concept of *Chiloglottis gunnii.* The complex of races included in *Chiloglottis gunnii* has considerable morphological unity and the complex is distinct from other *Chiloglottis* species. It consists of several morphologically distinguishable geographic races which are in some cases partially sympatric and which appear to rely on different thynnid wasps for pollination. The races probably will require taxonomic recognition when the complex is better understood.

(Cont'd. page 128)



DRAWING: C.E. Woolcock

A *Cryptostylis subulata* x 1
B *Cryptostylis erecta* x 1
C *Caladenia doutchae* x 1
D *Caladenia lobata* x 1
E *Drakea elastica* x 1
F *Chiloglottis gunnii* x 1
G *Cryptostylis leptochila* x 1
H *Caladenia roei* x 1

A pair of *Chiloglottis* species, *C. formicifera* and *C. trapeziformis* occur in the vicinity of Sydney. Flowers are superficially similar but differ in lip calli configuration. Tests in local bush areas indicated that two different thynnid wasps (*Neozeleboria* species) respond to the pheromones of the orchids. It cannot yet be assumed that these wasps are the pollinators of the respective orchids throughout their ranges, in view of the *Chiloglottis gunnii* observations. Pollinators may be replaced geographically and only field observation will determine if this is the case. The lip appendages of *Chiloglottis formicifera* are superficially ant-like and the specific epithet refers to this resemblance. The calli also resemble the wingless female thynnid wasps chemically and physically and it is the wasps which respond, not ants.

It is difficult to relate orchid flower characters to the mimicked female wasp which is usually unknown. Female thynnids which are the chemical and/or physical models for orchid flowers are rarely captured because they are usually found by males before the human observer chances upon them. Male wasps locate the wingless, pheromone-producing females, carry them off and the mating pairs feed on local flowers, especially nectar producing species of *Leptospermum, Eucalyptus* and *Verticordia.* The pairs can be collected but one has difficulty in assigning a collection to a known orchid pollinator. The wasp males differ by minor characters and there is uncertainty in matching a mating pair to a particular orchid species pollinator. One is sure that one has an orchid pollinator only when the insect is collected on the orchid and such collections are always single males.

I have observed females of only two orchid pollinators. The *Thynnoides* wasp which pollinates *Caladenia dilatata* in the Mt. Lofty area of South Australia was observed mating on *Leptospermum* (tea tree) in an area where orchid flowers were being used as bait. The wasp was the only common species in the area and mating males appeared identical to the unmated males attracted to the *Caladenia* flowers. The female bears little resemblance to the flower. The maroon labellum tip and similarly coloured calli may act as visual cues to the approaching male wasp but there is little physical resemblance beyond this, at least to the human observer. The chemical similarity is obvious to the wasp, however.

A greater physical resemblance between female wasps and orchid flowers occurs in the Western Australian *Drakaea elastica.* The flowers were being used as bait in an area where male wasps were cruising in numbers and actively visiting the bait flowers. Unusual activity in the grass several feet from the observation site involved a group of four male wasps and one female for which they were competing. The competition prevented her being carried away. The female was released and was observed to crawl up a grass stem, make her way to a leaf tip and hang in a position similar to that of a *Drakaea elastica* labellum, approximately the same height above the ground as that of an orchid flower. Her rear legs were rubbed several times over the tip of the abdomen and then over the abdomen surface, presumably releasing or spreading pheromone material. While she was being photographed another male came in behind the preoccupied photographer and removed her. I have the photograph, but not the specimen. The colour, position and general resemblance of this wasp to the flowers of *Drakaea elastica* was striking. Here was obvious physical and chemical mimicry.

The *Caladenia* species of south-eastern and south-western Australia are a large and diverse group, some being brightly coloured, fragrant, and adapted to insect visitors searching for food. *Caladenia patersonii* occurs in several forms across the southern states, the largest being *C. patersonii* var. *longicauda* of Western Australia, the flowers often measuring more than nine inches between sepal tips. This large and relatively common spider orchid attracts a variety of flies and bees to the flowers which have an odour suggesting fermentation. *Caladenia lobata* (Figure D), the butterfly orchid of the Stirling Mountain region, tends to flower later than *C. patersonii* although the flowering periods overlap slightly. *Caladenia lobata* is a pseudocopulation orchid visited by thynnid wasps and one might expect that pseudocopulation and food-promising mechanisms are mutually exclusive. In one area west of the Stirling Range I found a population which included late flowering *C. patersonii,* fresh flowers of *C. lobata,* and what appeared to be a hybrid swarm involving the two species. The intermediates recombined the white colour and pronounced odour of *C. patersonii* with the wide-fringed, dark-tipped labellum of *C. lobata.* Different species utilizing different attracting strategies can produce hybrids if the pollinator responds to both strategies: male thynnid wasps are nectar feeders as well as seekers after female sexual attractants. The male wasps may occasionally visit *C. patersonii* flowers in search of food and *C. lobata* flowers in search of females. In this example there are strong restrictions on such promiscuous behaviour, however. *Caladenia lobata* is later flowering and geographically more localized than the earlier flowering, widespread *C. patersonii.* These factors will help to maintain species integrity.

A parallel situation may prevail between races of the polymorphic *Caladenia patersonii* in eastern and western Australia and the equally widespread *C. dilatata,* another thynnid-pollinated pseudocopulation orchid. The *dilatata* X *patersonii* cross has been reported (Nicholls, 1969) and I have seen flowers which are morphologically intermediate in bush areas where the species flower concurrently. Differences in flowering time cannot be invoked as a breeding barrier between these species. In the absence of other information the pseudocopulation and food-promising specializations appear to be the obvious isolating factors.

Caladenia roei and *C. doutchae* are a pair of concurrently flowering species of Western Australia with green to maroon flowers on thin, flexible stems (Figures C and H). Their colonies are local and species were not observed together although they occupy the same general geographic area. They are visited by different thynnid wasps of undetermined genus. When the two orchid species are used as bait at a test site the appropriate wasp visits the flower simulating its female and does not visit the other orchid species. Chemical signals appear to effectively isolate these two similar orchids.

DISCUSSION: The field observations for the 1973 Australian spring suggest the presence of morphologically and geographically differentiated races in *Chiloglottis gunnii,* the races being isolated in part by differences in pheromones. Each wasp species appears to be strongly attracted to a particular orchid race and not to others. In transporting bait flowers to sites where *Chiloglottis* orchids are not known to grow the wasps are still very specific as to the race of orchid which they visit. The complex of biological races of *Chiloglottis gunnii* is an example of a species which may be in the process of differentiating into separate reproductive entities.

Well differentiated biological entities may still hybridize occasionally. This appears to be the case in the putative hybrids *Caladenia dilatata X patersonii* and *C. lobata X patersonii.* The intermediates appear to have little biological potential since the species have maintained their integrity over extensive geographic areas.

The complex systems of calli physically resemble female thynnid wasps in such species as *Drakaea elastica* and *Chiloglottis formicifera,* but bear less resemblance to insects in *Caladenia dilatata, C. lobata* and the *C. roei-doutchae* pair, although the statement must be hedged by admission that we do not know the appearance of females of the wasps concerned. The wasps initial attraction is pheromonal and only on close approach could a physical resemblance play a role, while humans distinguish the entities entirely by sight — we cannot sense the pheromones.

Perhaps Captain John Hunter, describing the novel life forms he saw in Australia in 1793, anticipated such relationships when he stated: "It would appear — that there is a promiscuous intercourse between the different sexes of all those different animals. The same observations might be made also on the fishes of the sea, on the fowls of the air, and I may add, the trees of the forest." One wonders what he would have said had he been aware of the remarkable relationships of Australian wasps and terrestrial orchids.

ACKNOWLEDGEMENTS:

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Much of this work would not have been possible without the advice and assistance of Stephen Clemesha, Barry Dudman, Laurie Byrne, Alex George, Ray Nash, Andrew Brown, Dorothy Woolcock, Peter Tonnelly and Ken Newbey. Their help is greatly appreciated. Especial thanks are due to Josephine Cardale of the CSIRO for insect identifications and to Collin Woolcock for his illustrations for this report.

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LETTERS TO THE EDITOR

CONSERVATION OF NATIVE ORCHIDS

Dear Sir,

Thanks for your reference to myself and the suggested Xmas cards. The project, I feel sure, could be successfully carried out by a keen group or enthusiast, but it should come from a group. However, we shall see.

I take it you are familiar with Bill Lavarack's comments on page 69 of The Orchadian March, 1979. (Left column, last section, and top of right column.) He mentions many things I don't agree with, but has hit the nail on the head when he suggests that preference for the larger flowers will spell the death of the smaller ones.

In other words, the present enthusiasm by "Judges" is in fact the start of the rat-race we have had in the exotic world for the past forty years. I can only hope that it does not take on. On page 70 you mention "New A.N.O.S. Judges", and you say: "Your ideas would be welcome." In the face of such a pressing invitation, I really cannot refuse. If any of our "Groups" want standards, then we must accept the majority decision, but we should reject any that does not adhere to the "optimum of the species". Neither shape, colour nor size should be given prominence. Mark my words: Standards mean awards, and awards is where the money is. When are we to see the suggested "Standards" ? And of course, the members should be asked to comment.

Enclosed is a letter I published six years ago. (Our boss thought it was time for an expression about conservation . . . "and when I ope my mouth, let no man speak".)* But read it yourself. Of course I never got an answer. Was Churchill right when he said: "He who can look back further, can see further ahead?"

Well, looking ahead I can predict the loss of many orchids, unless we can forestall the rat-race that is imminent.

BILL MURDOCH
30 Robey Road
May 29th, 1979 COAL POINT, N.S.W. 2283

(* More accurately this quotation is: "And when I ope my mouth let no dog bark!" — Ed.)

Reprinted with minor amendments from the Bulletin of the Newcastle "Group" of The Australasian Native Orchid Society of January, 1973.

Dear Editor,

As the views I express may not be the views of the people to whom I direct my opinion, I hasten to say the views are my own, and not necessarily those of our "Group".

I would also say, my conception of Conservation of Native Orchids implies the inclusion of ALL Native Orchids, and not only the comparative few that are amenable to transplanting, or of easy proliferation.

I make two submissions, which are: —

(1) RESERVES OFFER NO SOLUTION TO CONSERVATION OF NATIVE ORCHIDS.
(2) THE ESTABLISHMENT OF RESEARCH LABORATORIES OFFER THE BEST SOLUTION.

Is it necessary at this time to describe in detail the many attempts at "Reserves" and their ultimate failure? Why they failed should be the task of the Australian Orchid Council to ascertain.

The Bruxner Park Reserve could be a fruitful starting point, where, so I am informed, the last orchid passed on within one year of transplanting.

The Brisbane Botanic Gardens also offer a prime example. Of 500 Dendrobium bigibbum that were established, grew to perfection, flowered and disappeared; when I inspected the area the only evidence were the marks on the trees, and a few tags.

Possibly an authentic report could be had from other "Reserves", as to the amount of "replacing" that has had to be undertaken. I am informed that in places, the amount is considerable.

These facts have been conveyed to the A.O.C. The Council has, in fact, published two reports on Conservation. The first, in the Australian Orchid Review in December, 1969, the second in the same periodical in December, 1972. Being in entire disagreement with the first submission, I expressed my views to the author. Some correspondence ensued, and it was suggested I contact the author of the 1972 effort. Again several letters were passed, but it soon became apparent that there was a bias toward "Reserves", and that any reference to failures were not of interest.

Truly, vandalism appears to be proof against laws, pious hopes, wishful thinking and platitudes. Speaking of Laws, each State has an abundance, and all possessing a common factor, i.e. the impossibility of enforcement.

An impressive number of variants that, indivitually, precludes any degree of success. can be quoted. To do so, either to correspondents, or to the A.O.C. would gladly be undertaken.

Although I am personally known to several members of the A.O.C., and regard them with profound respect and friendliness, there are others who may ask on what premises I make bold to question their performance. Well, so be it.

As for some practical gesture toward conservation, for some few years past I have been engaged in procuring wanted Flora from several different forests, for our Royal Botanic Gardens, or the City of Newcastle Parks and Gardens. In all cases the necessary licence was obtained, or the consent of the owner. Forests from which material was obtained include Kramback, Berrico, Gloucester, Dungog, Chichester, Wyong, Wattagan, etc. Material for our Native Orchid Bush House, in the Blackbutt Reserve was obtained in 1972. Some few years earlier our local "Group" approached our City Council to build an Orchid House in this reserve. It was completed and was opened by our Lord Mayor on 10th February, 1973, when we invited all Native Orchid lovers to be present at our BBQ.

I do not for one moment suggest we solved anything in the way of conservation. Like other similar efforts, it afforded enthusiasts an opportunity to be associated with something of this sort; to others it fired their enthusiasm for native orchids, possibly proved a tourist gimmick, and afforded some further scope for vandalism.

BILL MURDOCH

Native Orchids of New Zealand — Epiphytes
6 — *Earina* Lindl.

by Dorothy Cooper

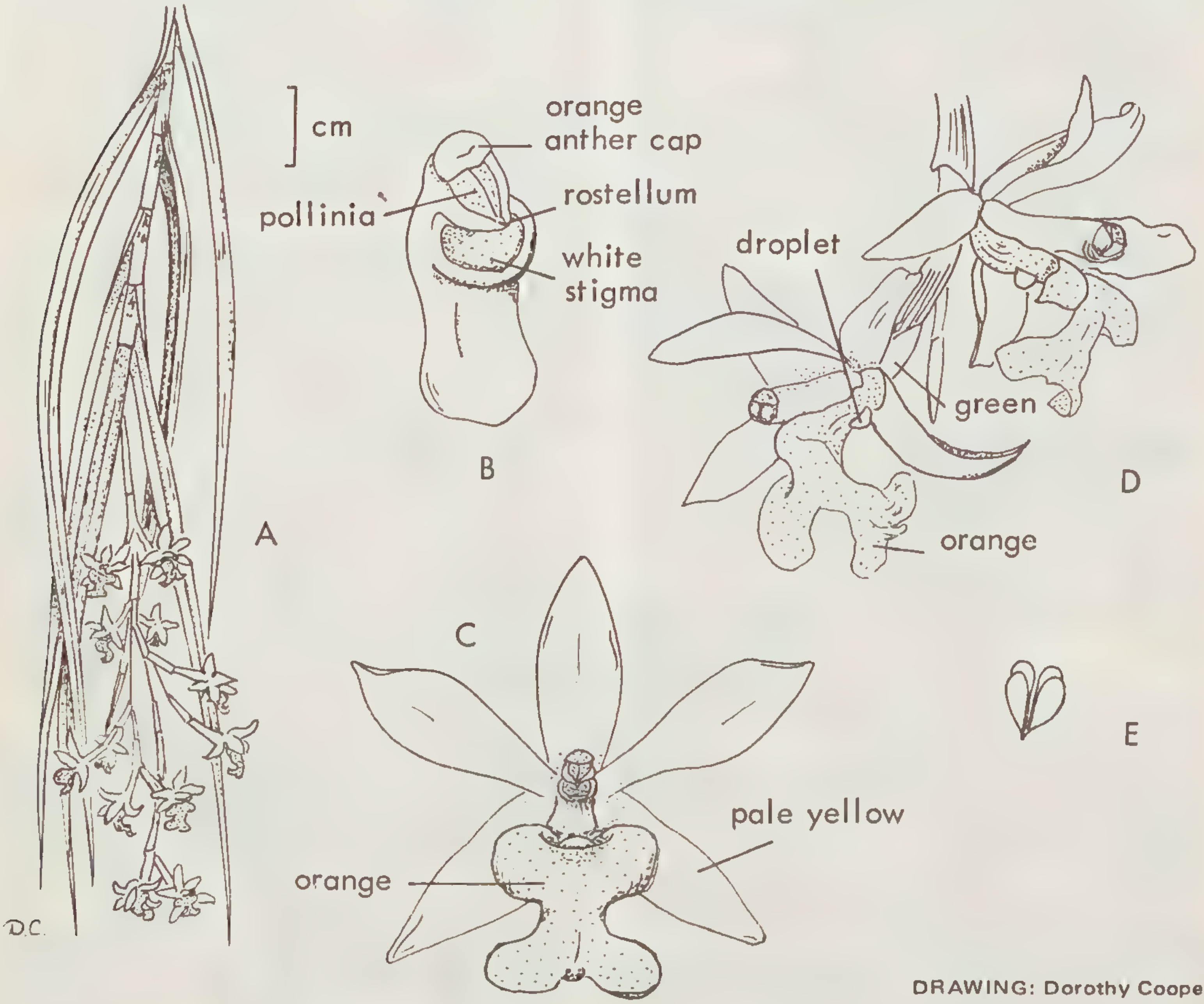
New Zealand has 6 species of epiphytic orchids: *Earina mucronata, Earina autumnalis, Dendrobium cunninghamii, Drymoanthus adversus, Bulbophyllum pygmaeum* and *Bulbophyllum tuberculatum.* They are commonly thought of as growing high on trees, a habitat which gives the benefits of more light and circulating fresh air but they also live quite happily at ground level where conditions are suitable.

You may have heard of the notorious Wellington "breezes", — I think air would **circulate** just about anywhere here, and in the Wellington area at least, *Dendrobium cunninghamii, Earina mucronata* and *E. autumnalis,* and to a lesser extent *Drymoanthus adversus,* quite commonly grow low on trees or on rocks at ground level. The first three in some areas grow in the ground litter itself, usually beneath beech *(Nothofagus)* where there is little other undergrowth or on rocky hillsides. *Bulbophyllum pygmaeum,* our smallest epiphyte, while not nearly as common, occasionally occurs on exposed rocks at the coast which says a lot for the hardiness of this tiny plant. I have not yet found *Bulbophyllum tuberculatum,* a slightly larger but even rarer species; the only published articles I have found report it growing on trees.

Our most common epiphytic orchid genus is Earina. It is not found in Australia but it does occur in New Caledonia, Tahiti, Samoa and Fiji. The two New Zealand species are endemic, that is, they occur only in New Zealand.

Both species are usually epiphytic on trees, notably beech, but other hosts are common, occasionally even occurring on our tree ferns *(Cyathea).* They are also found on rocks, on rocky hillsides, and in the ground litter itself. They have highly fragrant small flowers and I have observed large numbers of honeybees visiting a mass of *E. autumnalis* in flower in its native habitat on the bush covered eastern hills of Wellington. Roots of Earina form a dense tangled mass and it is quite easy to transplant on to pieces of tree fern. It likes to be shaded from hot summer sun and frequent misting of its leaves is beneficial when growing it at home.

In both species there is a terminal cluster of flowers. Leaves lie more or less in one plane, the leaf sheaths completely hiding the stem giving a jointed bamboo-look to the individual 'canes' which hang down in dense grass-like masses and at flowering time bear dozens of fragrant flowers.

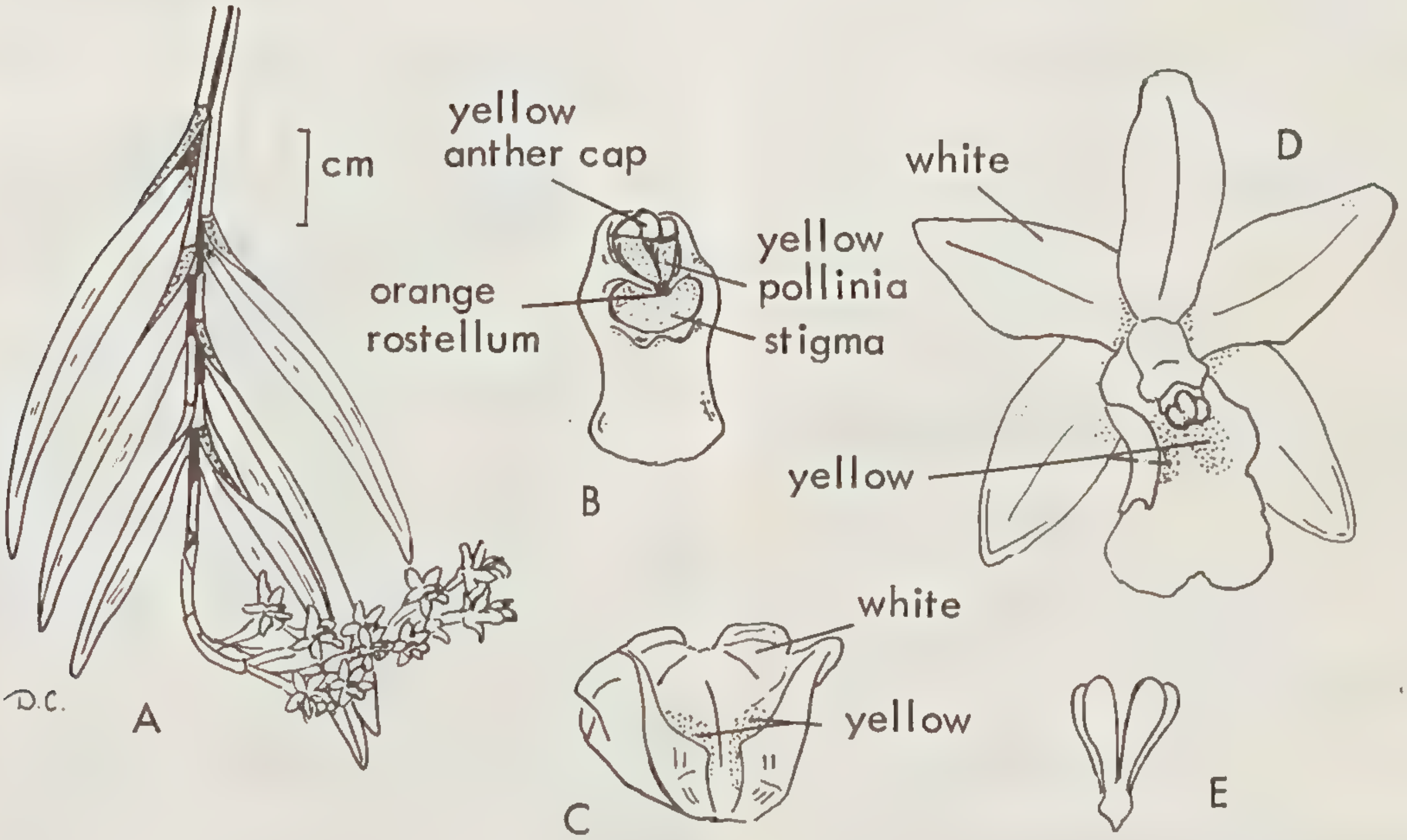


DRAWING: Dorothy Cooper

EARINA MUCRONATA
A plant with flower
B detail of column
C detail of flower
D flowers at tip of spike
E pollinia

Earina mucronata **Lindl.**

Older leaves in this species tend to break off at the junction with their sheaths, leaving the lower part of the stem without leaves. However, 1 — 20 leaves persist, each is 10 — 15cm long and 5mm wide at the base, tapering very gradually to a pointed tip. The numerous drooping slender stems hang down like a fringe. They are covered by the tube-like leaf sheaths which are often spotted with black. There are two distinct bursts of flowering, the main season is from September to November, but there is also a later flowering, or a second one, from December to May. Creamy-yellow flowers, 10mm in diameter, each with a ridged floral bract and spaced at greater intervals than in *E. autumnalis,* are borne on very slender stems about 10cm long. There are up to 40 individual flowers on each hanging cluster. The labellum is distinctive, it is orange with a peculiar deflexed bifid midlobe extension. There does not seem to be a nectary in either species but the tissue at the base of the labellum is easily punctured, and in this species a drop of moisture often exudes out on the underside of the lip. The petals are a little broader than the sepals which are undifferentiated, the dorsal being similar to the laterals. The stigma is broad and concave and there is a prominent rostellum joined to the 4 waxy pollinia. These, 2 per cell, seem to be ideally suited to insect pollination as the slightest contact with the rostellum brings away the pollinia, usually all four together, glued fast by the sticky rostellum at the point of contact — usually an insect's head — ready for cross-pollination with the next flower.



DRAWING: Dorothy Cooper

EARINA AUTUMNALIS
A plant showing upturned flower spike
B detail of column
C labellum from rear
D detail of flower
E pollinia

Earina autumnalis **(Forst.f.) Hook.f.**

This species has on each stem 1 — 10 leaves which are shorter, 5 — 10cm by 5mm, darker and more leathery than in *E. mucronata.* Shorter stems are usually erect, as is the flower spike which persists for a long time so that the plant generally bears several dead flower heads. Up to 40 white flowers, slightly larger than in *E. mucronata,* are set close together on the terminal flower cluster; each has a noticeable orange rostellum projecting forwards over the concave stigma. The labellum has two yellow patches on it and the sides stand up around the column. The petals are slightly wider than the sepals and the lateral sepals are slightly thicker than the rest of the perianth. The labellum is shorter than in *E. mucronata* and two longitudinal ridges at the back leave only a small passage to the base. The 4 waxy pollinia are slightly longer in this species, and again lift off easily. It flowers from February to May. Both species are found throughout New Zealand.

c/- Sedgwick Museum
Downing Street
October, 1979 CAMBRIDGE, ENGLAND

This is the first of a series of articles concerned with the progress being made by hybridists using Australian native orchids. Mr P.J. Collin provides us with an introduction to the subject and touches upon his own motivation and experiences as well as discussing basic essentials for undertaking a programme of hybridisation. This introductory paper has special reference to the genus Dendrobium, as does the second paper by Mr Roger B. Bedford, which will appear in the issue for March, 1980. Both are based on talks recently given to interested groups. Phil Collin's talk was presented to a Research Group at the Ryde School of Horticulture on May 4, 1979. The attention of other hybridists is invited to the "General Discussion" at the end of this paper — especially the first question and the answer given by Mr Collin.

HYBRIDISING AUSTRALIAN NATIVE ORCHIDS — THE GENUS DENDROBIUM

by P.J. Collin

Australia has approximately 700 species of orchids of which three-quarters are terrestrial and the remainder epiphytic. The genus Dendrobium (in Australia) comprises approximately 55 epiphytic species which occur predominantly in the coastal regions of the north and east. The distribution of Dendrobium species by States is: Western Australia 1, Northern Australia 3, Queensland 50, New South Wales 16, Victoria 2 and Tasmania 1. Many, including some of those naturally confined to the northern parts of Australia, can be satisfactorily grown 'cold' in the Sydney region.

The number of possible primary hybrids (both parents being species) is strictly limited; for example from 10 species, 45 different primary hybrids could be made; from 50 species, 1225 hybrids, and so on. However, the number possible for more complex hybrids (one or both parents not being a species) is infinite. There have been 67 Australian Dendrobium hybrids registered with the Royal Horticultural Society up to September, 1979. "A Checklist of Australian Native Orchid Hybrids" ($1.50) was published by the Australasian Native Orchid Society in December, 1977 and this is updated as new registrations are recorded in their quarterly journal *The Orchadian.* But these listings cover only those hybrids registered with the R.H.S. Many other hybrids have been made, but not registered.

Natural hybrids are sometimes observed in isolated areas throughout the regions in which both parents exist. Why is it that natural hybrids occur, and why is it that they do not occur more frequently? Two major factors favouring the formation of natural hybrids are the close proximity of the parent plants and the fact that many primary crosses produce large numbers of seeds and vigorous offspring. Two important factors not favouring the establishment of natural hybrids are —

(1) that many primary hybrids produce only few seeds when "selfed" or back crossed to the parents and of the seedlings produced many have weak growth habits; and

(2) a limitation on the pollinating agent which often involves a specific organism (e.g. an insect) in the pollination of species.

It is quite conceivable that the pollinating agent is not attracted to the hybrid flowers. The naturally occurring hybrids may therefore grow for many years but generally do not increase in number.

The restraints imposed by nature on hybridisation can be readily overcome by man, for instance the pollinia can be stored and transported. The pollination can be carried out in less than a minute. I generally use the following procedure: — From both parents remove the labellum. This allows ready access to the column. The pollinium is removed from the pod parent and discarded thereby preventing accidental self pollination. The pollinium is then transferred from the father plant to the pod plant's stigmatic region. I find a moistened tooth pick is satisfactory for this transfer. It is best to pollinate more than one flower. Whenever possible the reverse cross should be made. The pollinated flower is then labelled with all necessary details. After pollination, records should be kept as to the success or otherwise of the pod formation, ripening time, etc.

The sowing of seed is often considered the most difficult part of growing orchids from seed. I have found from experience that the sowing of seed can be successfully and rapidly carried out at home.

The orchid seed has little or no reserve of plant food; therefore the environment must provide both the physical and chemical requirements for plant growth. Having regard to the thousands of seed dispersed from pods, in nature it is indeed a rare event for an orchid seed to germinate and grow.

Man provides both the physical and chemical requirements for successful germination and early growth in the form of an agar based medium containing the necessary chemicals. Unfortunately, this medium is also ideal for the growth of certain fungal and bacterial organisms which readily kill orchid seeds and seedlings. For this reason sterile conditions must be rigidly maintained. This does not necessarily mean outlay of expensive equipment. All that is required is a pressure cooker, a length of wire, a razor blade and a candle. As a general rule I put down three flasks from each pod, sometimes one (rarely more than one) is lost due to mould growth.

The growing medium and flasks are sterilized in the pressure cooker, and the pod or seed by treatment with chlorine solution (hypochlorite solution). If the seed has to be kept for some time, remove from the pod and store under dry and cool conditions such as over a desiccant in a refrigerator. Ideally it is best to sow seed directly from the unopened pod, as the seed will then be free of contamination. All that is required is to sterilize the outside of the pod, slice open with a razor blade and transfer a portion of the seed by means of the wire to the flask. Both the razor blade and wire must be sterilized by flaming with the candle flame.

After sowing the flask is immediately stoppered. The seed is distributed across the surface of the agar by gentle agitation of the flask. A rubber stopper with a centre hole plugged with cotton wool is used. The flask is labelled and placed in a somewhat shaded area. After germination the light intensity is gradually increased to approximately 50 per cent.

The time scale for many of our Dendrobium hybrids is: pollination carried out in September, pod harvested in December and the seedlings deflasked in the following spring. The deflasking procedure involves removing the seedlings (this sometimes requires breaking of the flask), which are then immersed in water and the agar completely removed. The plants are individually inspected. Old and damaged roots are removed, the seedlings are planted into community pots containing a free draining compost, such as an equal mixture (volume/volume) of 3mm charcoal and peat moss. In some instances the seedlings are directly placed onto slabs of cork or weathered hardwood. From here on normal orchid growing procedures are used. It is desirable to grow about 100 seedlings of each cross so that the variation in plant characteristics can be observed.

I hybridise for two main reasons. The first is 'curiosity' and the second is the development of plants having desirable characteristics. As an example of the 'curiosity' aspect, I have selected seven cool growing Dendrobium species of widely different growth habits, ranging from the 'normal' through the 'terete' to the 'fleshy' leaf types. The seven species used were: *Dendrobium gracilicaule, D. tetragonum, D. teretifolium, D. beckleri, D. striolatum, D. linguiforme* and *D. pugioniforme.* Of the 21 possible primary hybrids, I have so far made ten. One aim of the experiment is to study the characteristics passed on to the offspring. For instance, the 'terete' leaf is dominant over the 'normal' leaf type. In fact, on the results so far obtained, the seven species plants can be divided into three groups, namely: —

Group 1: 'Normal' leaf type.
D. gracilicaule, D. tetragonum.
Group 2: 'Terete' leaf type.
D. teretifolium, D. beckleri, D. striolatum.
Group 3: 'Fleshy' leaf type.
D. linguiforme, D. pugioniforme.

In this experimentation it has been found that: —

(a) crosses within any one group produce vigorous offspring, with no marked dominance of any one parent in growth habit;
(b) crosses between Groups 1 & 2 produce moderately vigorous offspring in which Group 2 is dominant in growth habit;
(c) crosses between Groups 1 & 3 produce weakly growing offspring in which Group 3 is dominant in growth habit;
(d) crosses between Groups 2 & 3 produce weakly growing plants in which Group 2 is perhaps dominant in regard to growth habit.

The above groupings closely parallel the taxonomic classification (after Dockrill). The conclusions mentioned will be modified as additional results are obtained.

My second reason for hybridisation — to produce plants that have desirable characteristics — is concerned with such aspects as better flower shape, larger flowers, more flowers, different flowering times, more vigorous plants, mat forming plants, etc. To obtain a degree of success above the average, the hybridiser must have knowledge of certain facts, which include the following: —

1. An overall plan.
2. A detailed knowledge of the species plants.
3. A detailed knowledge of the hybrid plants.

He must also be prepared to carry out 'selfings' and 'back' crosses of the primary hybrid. Often the desired characteristics show up with the later generation offspring of these crosses.

In this paper I shall mention only two primary hybrids that have desirable characteristics. These are: —

- Dendrobium 'Star of Gold', a cross between *D. tetragonum* and *D. falcorostrum,* the former having a small number of large colourful yellow and brown spidery flowers, flowering mainly in spring and occasionally at other times; the latter having numerous white flowers, flowering in spring. The hybrid plants have numerous attractive large yellow, somewhat spidery flowers, with red to brown spotting. The flowering period for different clones is Autumn and Winter.
- Dendrobium 'Hilda Poxon', a cross between *D. tetragonum* and *D. speciosum.* The hybrid plants have strong racemes of numerous good yellow large spidery flowers. Flowering time is also Autumn and Winter.

The above two hybrids extend the normal flowering period of our Dendrobiums from Spring to Autumn and Winter.

As flower colour is of great importance, I will mention some observations on the predominant colours of the sepals and petals of the parent species and their primary hybrids. The observations relate to crosses involving the following species: — *D. tetragonum* (predominant colour: yellow & brown), *D. kingianum* (pink), *D. aemulum* (white), *D. gracilicaule* (yellow), *D. falcorostrum* (white), *D. ruppianum* (white), *D. speciosum* (yellow) and *D. adae* (yellow). Tentative conclusions are that the yellow of *D. tetragonum* is dominant; the yellows of *D. gracilicaule* and *D. speciosum* are recessive, the brown of *D. tetragonum* and pink of *D. kingianum* show incomplete dominance characteristics.

THE FUTURE: As to the future, I will only mention a few of the many possible developments. The first relates to germination techniques. As mentioned previously, the accepted technique is germination on a sterile plant nutrient — agar mix. This technique produces large quantities of seedlings from a relatively small number of seeds and includes both the vigorous and weakly growing plants. Now, remembering that there are generally thousands of seeds in any one pod, it perhaps would be more desirable to sow larger quantities of seed and grow on only the more vigorous plants. My own experience indicates that many of the other plant characteristics are independent of the factors controlling the vigour of the plant. Investigations should be directed to techniques that discriminate against the weaker plants, such as one of the methods used many years ago of sowing the seed directly onto substrates under **non-sterile** conditions in which the survival rate was often very low. The aim would be to produce a simple technique in which a large number of seeds are sown and only the more vigorous plants survive.

In regard to plant breeding I will only mention two areas that show considerable promise. The first is the development of cool growing hybrids having *D. bigibbum* in their ancestry. *D. bigibbum* (the Cooktown orchid) has several desirable characteristics which include the shape, size, number and colour of the flowers. It is probably the only Australian Dendrobium that has wide petals. Its main disadvantage is that it is difficult to cultivate under cold conditions as experienced in the temperate areas such as Sydney. To my knowledge two crosses of *D. bigibbum* with cool growing Dendrobium species have been registered: one with *D. tetragonum* and the other with *D. kingianum.* I have seen several clones of the former and they do have attractive flowers. However, I am not certain if they are cool growers. The other hybrid I have not yet observed. (*) There is little doubt that additional hybridising of *D. bigibbum* with cool growing Australian species and hybrids has been undertaken and will continue to be undertaken in the future and will produce hybrid plants of outstanding quality.

Another direction in plant breeding will be the development of mat forming orchids having a range of flower colours and flowering times. These hybrids may well have *D. mortii* and/or *D. rigidum* in their ancestry.

GENERAL DISCUSSION (following the original delivery of this paper, which was illustrated with colour slides and plants): —

Q: Is there much information available on particular crosses?

A: In general no; some crosses have been registered with the Royal Horticultural Society. Therefore the parents are known, but very little written information beyond this is available. The Australasian Native Orchid Society through their journal, *The Orchadian,* is trying to foster liaison between hybridisers, and would like more details of the progeny of crosses, including 'failures' as well as 'successes'.

Q: Can the time from seed to flowering be shortened?

A: Seedlings generally grow throughout the year in contrast to many flowering sized plants which have a definite growing period. Therefore improvement in growing conditions in the winter months by increasing the temperature and 'daylight' hours could be beneficial. Also growing of the more robust seedlings would lower the average time required to flower.

Q: Do you think that nutrients present in peat may contribute to better growth in peat moss and charcoal mixture?

A: This I cannot answer. However, it is an observed fact that some orchids prefer peat moss or similar material to be present whereas others prefer the more open conditions of charcoal or charcoal-bark mixtures.

(* See *The Orchadian* Vol. 6, No. 3, p. 68, where the Editor makes a special plea for more information on this long awaited cross, registered as 'D. Esme Poulton' by B. Poulton, October, 1978. Presumably it was a successful cross to have been registered?)

Orchids need fertilizers, but unless there is adequate drainage and air movement, the fertilizer cannot be utilized.

Q: Do you think that in the crosses you have mentioned there are single genes controlling the factors observed?

A: A difficult question. The tentative conclusions referred to may prove to be incorrect. They do, however, represent a starting point and give guidelines in planning breeding programmes. Some of the characteristics observed do appear to fit into a single gene pattern.

Q: Are the petal, sepal and labellum colour characteristics closely linked in inheritance?

A: From my experience I would not be surprised if the colour inheritance patterns of the sepals and petals are similar, but different for the labellum.

May, 1979

33 Darnley Street
GORDON, N.S.W. 2072

FOOTNOTE: In our March, 1980 issue we shall publish a selection of photographs of Mr Collin's crosses. — Editor

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THE REDISCOVERY OF *DENDROBIUM CONVOLUTUM* Rolfe

by J.J. Betts

In *The Orchadian* (September, 1979) Vol. 6, No. 5, page 113, Mr T.M. Reeve identified the photograph of an "unnamed" dendrobium of the Latouria Section shown at page 45 of Andreé Millar's *Orchids of Papua New Guinea* (1978) as *Dendrobium convolutum* Rolfe.

The identification resulted from Mr Phil Spence's submission to me, as editor, towards the end of 1978 of a description of one of the seven plants he had viewed in Mrs Millar's collection. Mr Spence had prepared a formal description and arranged for drawings to be done by Mrs Margaret Perkins. We now publish these. Before proceeding with a botanical Latin description I discussed the paper with Mr D.F. Blaxell of the Sydney Herbarium and later with Mr Reeve during a brief visit to the Kew Herbarium on June 15, 1979. Mr Reeve's findings at Kew were sent to me early in October, 1979 in time for late inclusion in *The Orchadian* for the September quarter.

After looking at Rolfe's original description (Kew Bulletin (1906) page 375) we have agreed that the work done by Mr Spence in describing what seemed to be a new species should now be published and illustrated as a "rediscovery" of *Dendrobium convolutum* Rolfe, after a lapse of seventy years or more.

Rolfe's description of 1906 is in Latin without full English translation. We therefore give a complete translation here: —

"281. *D. convolutum* Rolfe; related to *D. chloropterum* Reichb. f. and S. Moore, but distinguished by bigger flowers and by wider petals and side lobes of the labellum.

Pseudobulbs clavate (club-shaped), about 22 cm long, 14 mm wide, two-leaved at the apex. ***Leaves** . . . . . .? **Scape** slender, terminal, 12—15 cm long, 4-flowered. **Bracts** triangular, acute, 5 mm long. **Pedicels** glabrous, 2.5 cm long. **Sepals** glabrous, triangular-ovate, acute, keeled, 16—18 cm long, the laterals into an obtuse mentum extended 6—8 mm long. **Petals** oblong-elliptic, subacute, with narrow base, narrower than the sepals. **Labellum** 3-lobed; the lateral lobes broadly oblong, obtuse, enveloping the column, overlapping at the apex; the intermediate lobe kidney-shaped, apiculate, somewhat folded together lengthwise; the central disc strongly two-callused, almost (?) 3-keeled. **Column** broad, 2 mm long, 3-toothed at the apex."

(* Rolfe gave no description of the leaves.)

A.N.O.S. JUDGES

On the recommendation of the Registrar of the A.N.O.S. panel of judges, Council on 14 November, 1979 appointed Mr Don Barnham as Associate Judge. Mr Barnham qualified by examination at the first training course conducted by A.N.O.S. and is the fourth of its graduates to be appointed.

Mr Spence's description (1978) follows: —

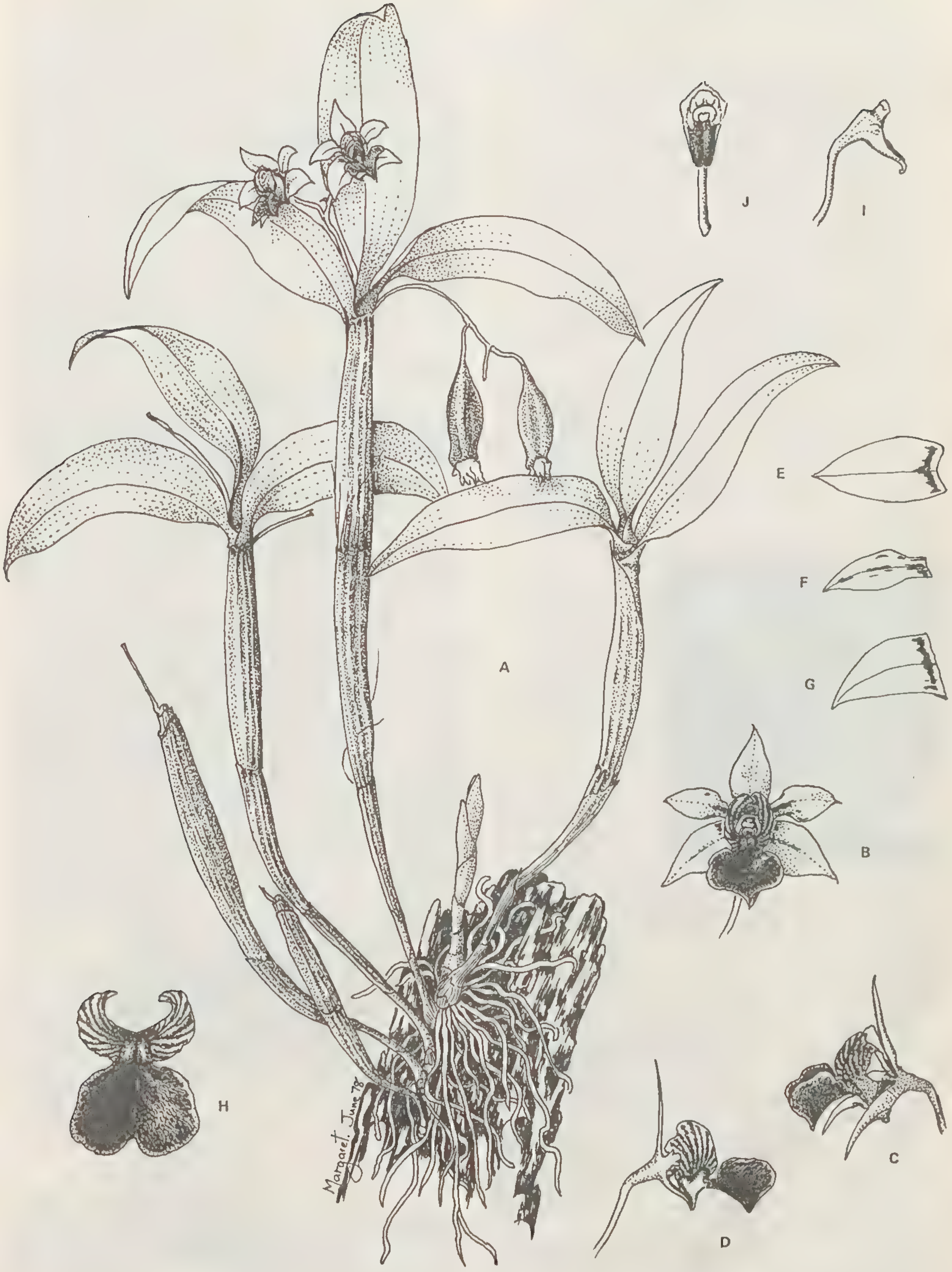
"**Plants** epiphytic, growing into tufts. **Pseudobulbs** 300 mm tall, somewhat fusiforme, longitudinally furrowed, 13 mm thick near the middle of the pseudobulb and 4 mm at the fourth clothed sheath bract from the rhizome. Pseudobulbs tightly packed along rhizome alternating. New pseudobulbs are clothed with about nine scarious bracts. **Leaves** broadly ovate-lanceolate, 2—3 crowded near the apex of the pseudobulb, 50 x 135 mm ovate, rather thin in texture for Section Latouria. Racemes 100 to 120 mm long, 1.5 to 2 mm in diameter. The peduncle much longer than the rhachis. Each pseudobulb often flowers for several years in succession with 1 — 3 racemes. **Flowers** about 2—7 evenly along rhachis. Flowers glabrous 30 — 35 mm in diameter with a straight broad mentum which has a small broad hook on the end. (See C) Sepals and petals bright green with small black/purple markings on edges of ribs in petals and also where sepals and petals join to column and labellum. **Labellum** a rich black/purple edged in green, horns of labellum veined in green. Petals 14 x 5 mm lanceolate. Dorsal sepals 16 x 8 mm lanceolate. Lateral sepals 15 x 8 mm lanceolate triangular curved downwards. Labellum 16 x 17 mm, two side lobes 5 x 8 mm broadly clavate obtuse joining labellum near calli. Calli extremely pronounced 3 x 1 mm acuminate protruding upward from labellum, 3 mm high with a gap in between of 1 mm. Skirt of labellum built up of two extremely obtuse shapes 8 x 8 mm butting side by side.

A tropical species from New Guinea found in the coastal region of Finschhafen collected by an assistant to Andreé Millar and drawn from one of seven plants which I viewed. Material was brought to my attention by Mrs Andreé Millar O.B.E., who informed me that it had been brought to her attention by a Finschhafen man who brought it to Port Moresby from his home district.

— P. Spence."

CAPTIONS FOR DRAWINGS ON OPPOSITE PAGE

A	Flowering plant
B	Flower from front
C	Flower from side
D	Cross-section of flower
E	Dorsal sepal
F	Petal
G	Lateral sepal
H	Labellum
I	Lateral view — stripped flower
J	Frontal view — stripped flower



DRAWING: Margaret Perkins

Bulbophyllum tuberculatum Colenso, on the Australian Mainland

by S.C. Clemesha

During August, 1978 I visited an area of forested land at Coopernook Creek in the Eastern Dorrigo area (not to be confused with the town of the same name near Taree). The area had been logged principally for Brush Box but a few other species had been taken also.

There were four of us in the party and as we clambered over the logs many orchids were found, i.e. *Dendrobium aemulum, D. gracilicaule, D. tetragonum, D. speciosum* var. *hillii, D. teretifolium* var. *fairfaxii, D. tenuissimum, D. beckleri, D. pugioniforme, Sarcochilus olivaceus, S. falcatus, Plectorrhiza tridentata, Bulbophyllum exiguum, B. weinthalii* and *B. elisae.*

Some of the time we were looking over the logs we separated and on one such occasion Mr N.A. Anderson collected a strange *Bulbophyllum* growing close to a plant of *B. elisae.* It grew on a tree which we think was a Red Bean *(Dysoxylum muelleri).* He immediately recognized the plant as distinct and as soon as we met up again showed it to me and gave it to me to try and identify.

I mounted the plant and treated it carefully as I thought it to be *Bulbophyllum bracteatum* and had it been, it would have been a slight extension in its range from that reported by Dockrill. Buds were first observed in early February and by the 20th of that month the flowers opened. The flowers were photographed and then one spike was pressed and the other preserved in alcohol. Both have been sent to the N.S.W. National Herbarium in Sydney.

Bulbophyllum tuberculatum

Photo:
S.C. Clemesha
(B.&W. print by
G. Wells)

I easily was able to identify the plant as *Bulbophyllum tuberculatum* — previously known only from New Zealand (principally the North Island) and Lord Howe Island. It is the only epiphyte common to Australia and New Zealand.

Following this, a second trip to the area was made by Mr N.A. Anderson, Mr N. Anderson, Jr., Mr R. Smith and myself.

The log stacks had not been disturbed since our last visit. No more plants of *B. tuberculatum* were found on the original tree but plants of it were found on two other Red Bean trees about 500m apart. Once again the trees were near the creek and the plants were closely associated with *B. elisae.*

On one branch, 14 plants were found. All were smaller than the original find but were readily identifiable by their numerous old flower spikes. Plants of *B. elisae, Dendrobium beckleri* and a small *D. teretifolium* var. *fairfaxii* grew on the same branch. This was observed by all of us and photographed.

As the area has standing Red Bean trees in it and has not been completely cleared, it is hoped *B. tuberculatum* will survive there. It is likely that it will turn up in other areas, especially where *B. elisae* occurs.

B. tuberculatum can be distinguished from *B. exiguum* by its more angular, closely packed bulbs and its smaller, less widely opening flowers which are only 3 — 4mm long and are white with an orange labellum. The peduncle, pedicels and ovaries all are minutely tuberculate.

Out of flower, adult plants of *B. tuberculatum* can be distinguished from young *B. elisae* by their possession of old flower spikes.

B. tuberculatum was described in New Zealand in 1884 and it occurs in scattered localities through the North Island and also the extreme north of the South Island. It is much less plentiful than the other New Zealand species of Bulbophyllum *(B. pygmaeum).*

It was recorded from Lord Howe Island by Rupp in 1935. He remarked on the prominently glandular-hispid penduncles, pedicels and ovaries. These are present on the Coopernook Creek specimens also.

I could find no difference in the description and photographs I have of the species (based on New Zealand material) except the flowers are slightly smaller which is not surprising as the plant was not in good condition when found as it was on a fallen tree.

c/- Post Office
MOONEE BEACH, NSW. 2450

FOOTNOTE (5/11/79)

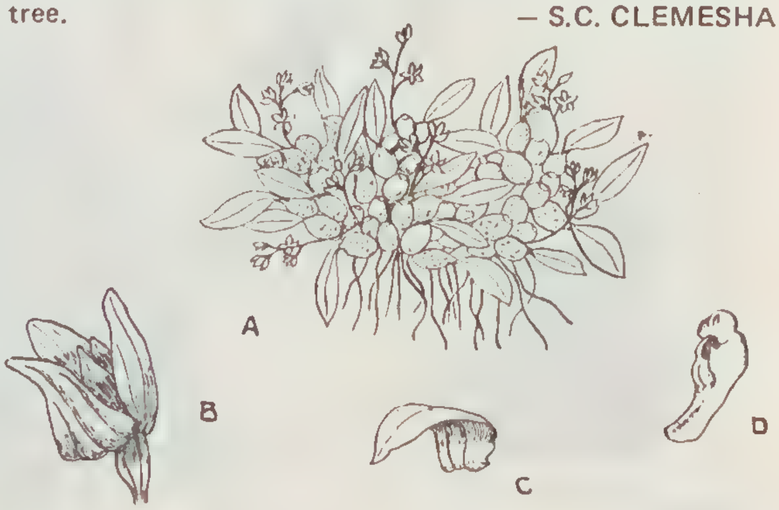
During October, 1979 Sandy Anderson, Garry Wells, Mike Harrison and I visited the *Bulbophyllum tuberculatum* area and more plants were found still surviving on the trees which had been fallen about 12 months earlier. Some of the plants were in very good condition and had pseudobulbs as large as Lord Howe and New Zealand specimens and one had a seed capsule. In all we found about 20 more plants.

Later that day we visited an area of rainforest being cleared for the forestry authority for reasons I cannot understand. The area was in Wild Cattle Creek State Forest and it is at least 10 km by air from the Coopernook Creek locality.

Bulbophyllum weinthalii was plentiful on a few hoop pines and it was not long before we found more plants of *Bulbophyllum tuberculatum.* It was more plentiful in this locality than in the one where it first was found and on one branch over 30 plants were found, 4 of which had seed capsules and one plant had 2 capsules on the one spike. The minute tubercules are visible on the ribs of the ovary. It is regrettable that this area is to be clear-felled but plants were found on the edge of it and we have been told that no more rainforest is to be cleared in the area. If this is correct, then *B. tuberculatum,* which obviously exists elsewhere in the general area, will survive though be very hard to find.

B. elisae grew on every tree on which *B. tuberculatum* was found but not in as close association as in the first area. It was found on at least 3 different species of tree.

— S.C. CLEMESHA



(E.D. HATCH, Nov. 1948)

Bulbophyllum tuberculatum Colenso. Reproduced from drawings by E.D. Hatch in "The Epiphytic Orchids of N.Z. and a New Species of *Pterostylis* from Mt. Egmont" read before the Auckland Institute, 15 December, 1948 and published as a booklet in February, 1950. Fig's A—D were copied by Hatch from the holotype; "after Smith".

A	Plant	C	Labellum from front
B	Flower from side	D	Column from side

TERRESTRIAL CULTURE NOTES

by L.T. Nesbitt

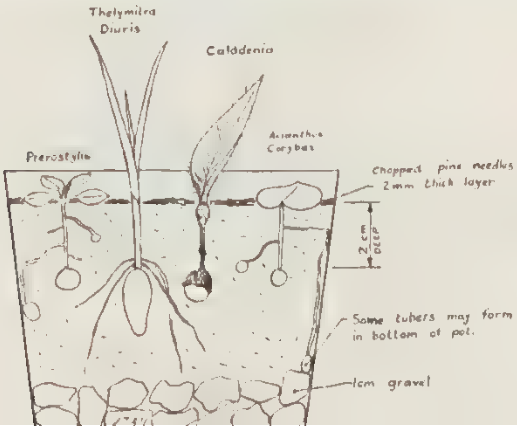
Sunburnt faces, shorts, and perspiration are sure signs that Summer is here once again. The terrestrial grower can relax by a pool, or spend his days at the beach, without the slightest worry about watering orchids, sunburnt leaves, bud drop or painting the glasshouse. His orchids have all gone dormant and he can virtually ignore them until the milder days of Autumn. What a boon if you normally take holidays at Xmas or live in an area where water restrictions apply!

Daylight saving keeps me out in the garden till late in the evenings and I often find time to take a potfull of dormant terrestrials into the shed for repotting. **The colony type orchids definitely prefer to be repotted each year.** They respond to the extra room and new soil with increased vigour, larger flowers and even more numerous tubers at the end of the season. They do not have to be repotted however, as they will grow quite happily in a crowded condition. I have several 20 cm pots of *Pterostylis pedunculata* at Kersbrook which have not been repotted for 5 or 6 years. The plants are so jammed together that, when they commence growth in Autumn, they lift the top layer of soil like a pancake and I have to shatter it with a few sharp blows and then water the loose soil down between the hundreds of shoots. These plants still manage to produce a few flowers but the stems are short and the crowded leaves are anaemic looking. If you intend to exhibit your greenhoods, acianthus, corybas, microtis, etc. then you should repot these plants each summer.

The seedling type terrestrials (Diuris, Caladenia, Thelymitra) are probably best left undisturbed for a few years, mainly because of tiny seedling tubers which sometimes seem to suffer during repotting. Diuris and Thelymitra have very robust root systems and certainly grow better in fresh soil each year. The choice is yours. I once repotted everything, mainly out of curiosity, to note tuber size, increase in numbers if any, and effect of different soil mixes. These days I am forced to be a little more selective and repot on the average each second year. With colony types, too many plants start growing out of drainage holes if left any longer than two years.

My soil mix is 40% sandy loam, 40% fine sand (with uniform rounded particles which do not 'cake'), and 20% German peat moss. A handfull of blood and bone is added per bucketfull of soil and the whole lot is put through a 5 mm (3/16") sieve and mixed together. It must be kept damp to eliminate dust. This mix may not suit your area. Melbourne growers use very coarse sand or even fine gravel to improve drainage.

Before repotting I wait until the plants have died down and the soil in the pot has dried out completely. Under these conditions all roots and soggy old tubers dry up and do not absorb moisture again. Adelaide Summers are very dry and even if it does rain, the following day or two is sure to be sunny and windy so that the effect of the rain is soon lost. It helps to soak the pots a day or two before repotting as moist soil is easier to work. I knock out the pot into a sieve and gently crush the lumps of soil. The soil falls through, leaving the tubers behind. The largest tubers are selected for my exhibition pots and the smaller ones are grown on in separate pots. This is the time when you win or lose orchid shows because when repotting you determine how your pots will look in flower in 3 to 9 months time. Remember that the largest tubers make the largest plants, have the tallest stems and are the first to flower. I like to place the largest tubers in the centre of the pot and then place concentric circles of gradually smaller tubers towards the outside of the pot. This gives a cone shaped effect when in bloom with all flowers clearly visible. Other patterns are possible. You may prefer the tallest plants at the back grading down to smaller plants in front, or all plants of equal height. All you have to do is visualise the plants in flower. I plant tubers 2 cm apart and 2 cm deep as a general rule. The old soil may be re-used with a little blood and bone added. If there was any sign of disease in the previous season, then discard the soil and wash the tubers before repotting. I use a topping of chopped pine needles on my pots to prevent soil erosion and provide cover for seed. Pine needles are cut into lengths of about 2 – 4 cm by spreading them on my concrete driveway and running over them with the lawn mower. Any needle-like leaves of native trees or shrubs will serve this purpose. I ram down the soil in the pot and then water immediately to eliminate air spaces in the soil. The pots are then returned to their places in the shadehouse. On hot Summer nights I give the pots a cooling spray with the hose. This dampens the top cm of soil and prevents excessive tuber shrivel. If you have only a few pots they can be moved to a cool, dry spot for the Summer and will not need watering unless they are species from Queensland or northern New South Wales where the Summer rainfall is higher.


Thelymitra
Diuris
Caladenia
Acianthus
Corybas
Pterostylis
Chopped pine needles 2mm thick layer
2cm deep
Some tubers may form in bottom of pot.
1cm gravel

One such species is *Pterostylis baptistii* which has a very short dormant period in Adelaide. It goes dormant at the end of October and must be repotted before Xmas because the tubers are then beginning to shoot again. Our local South Australian species do not begin to shoot until February unless given frequent waterings in Summer.

If seedling tubers are known to be in a pot, they will be in the top 1.5 cm of soil. They may be very small and it is not worth trying to find them. I knock out the plug of soil from the pot and carefully remove this top layer of soil containing the tiny tubers. It is gently crushed and put to one side. After the larger tubers have been repotted, the soil containing the seedlings can be replaced on top of the pot or pots and covered with a thin layer of fresh soil. In this way the tiny tubers are not buried too deep. Also the helpful mycorrhiza, which aid in seed germination, are transferred with the soil and tubers to additional pots. Thick moss or liverwort growths on top of pots which are not repotted should be removed during Summer as these growths will smother developing seedlings next Winter.

Terrestrial orchids can be easily transported during the dormant stage without harm. This is the usual time to distribute spare tubers. Pack them in dry peat moss in bags or boxes. Do not use damp packing materials or the dormant tubers will rot. Terrestrials also transport readily during the early growth period from the time the leaves have formed until the middle of Winter. The plants are capable of continued growth if the tuber is detached during this time. Provided the roots are not allowed to dry out, all the soil can be removed and the plants can be shipped as bare root plants. If potted up immediately on arrival they look a little tattered but will flower and produce good, healthy tubers by the end of the growing season.

South Australian terrestrials should not be disturbed in Springtime because they are nearing the end of their growth cycle and do not have the time or inclination to produce new leaves or root systems. Collecting in Springtime (only from private property and with written permission, of course) results in unacceptably high losses and should never be attempted unless there is no alternative such as imminent land clearance. Tubers which have begun to shoot are also easily damaged as the shoots are very brittle. Some of the hardier species will produce new shoots but the more desirable species do not seem to reshoot and the tuber eventually rots away. I like to complete all repotting before shoots are more than 2 cm long.

Pterostylis barbata Lindl. and *P. plumosa* Cady

by Peter Vaughan

On seeing these plants for the first time in 1978 I was immediately struck by their magnificence. Amongst other species of Pterostylis these plants stand out in size, colour and, simply, their difference from the other members of this advanced genus. Very few plants in the world possess voluntary movement and although I know little of non-Australian members I would imagine the genus Pterostylis would hold as many "irritable" species as all other Australian genera combined. Yet here we have two species which discarded this superb adaptation, probably along with their intoxicating juices to settle for the colourful and hairy "jiggling" labellum similar to attractions used by lower forms of plant life; that is we progress from primitive ancestral stock to a very advanced feature and then back to a primitive feature.

This of course assumes these species did pass through the irritable-labellum stage before speciation separated them from other species. This is a debatable point that can never be proven but the similarities to the rest of the genus suggest this.

The reversion to a so-called primitive feature is an excellent example of the philosophy that "it is not how it *looks* but how it *works* that matters". If people then wonder why the mechanical movement of the labellum was developed the answer seems to be: To tap a large source of available pollinators and reduce competition for pollinators from other plants.

Description of species:

The leaves of these species do not lie flat like normal Pterostylis species but instead are very robust and stem leaves are present in *P. plumosa*. The tuber is the largest in the genus and being such is a favourite food of corellas, galahs and bandicoots. The plant does not multiply vegetatively and is reported to be difficult to grow from seed. The single flower is curled into a tunnel with a "valve" formed by anther appendages to ensure insects pass through from bottom to top and not vice versa. The labellum is threadlike with a coloured knob ending and sparse scattered hairs along its lengths. It serves its function by waving in the breeze and attracting a pollinator by colour rather than scent — the sole attractant other greenhoods possess. Once attracted the insect must be lured into the flower by scent as there is no significant colour charge as apparent in species such as *Dendrobium kingianum.*

P. barbata differs from *P. plumosa* by its sepals becoming threadlike whilst the latter has a naked base to the dorsal sepal. Vegetatively *P. barbata* has a robust set of basal leaves whilst *P. plumosa* has mostly stem leaves. The differences sound minor and are subject to controversy. Moore and Edgar in *Flora of New Zealand* refer to their *P. barbata* as follows: "Resembling the eastern Australian form and if considered specifically distinct may be referred to as *P. plumosa*."

Distribution and Habitat:

P. barbata is confined to the south-west of Western Australia. East of the Nullabor Plain *P. plumosa* begins to appear and is found in South Australia, Victoria, Tasmania, New South Wales and New Zealand. The northern limit seems to be Bathurst in N.S.W. Despite its wide distribution its discoveries have been slow. It was not found in New Zealand until 1955 and although growing at Maroubra in the Sydney area it was not discovered there until 1908.

The habitat of the species varies according to the local rainfall and conditions. In *Orchids of Western Australia* Alex George commented that it grows in forests and swamps of wetter areas. In South Australia it is reported

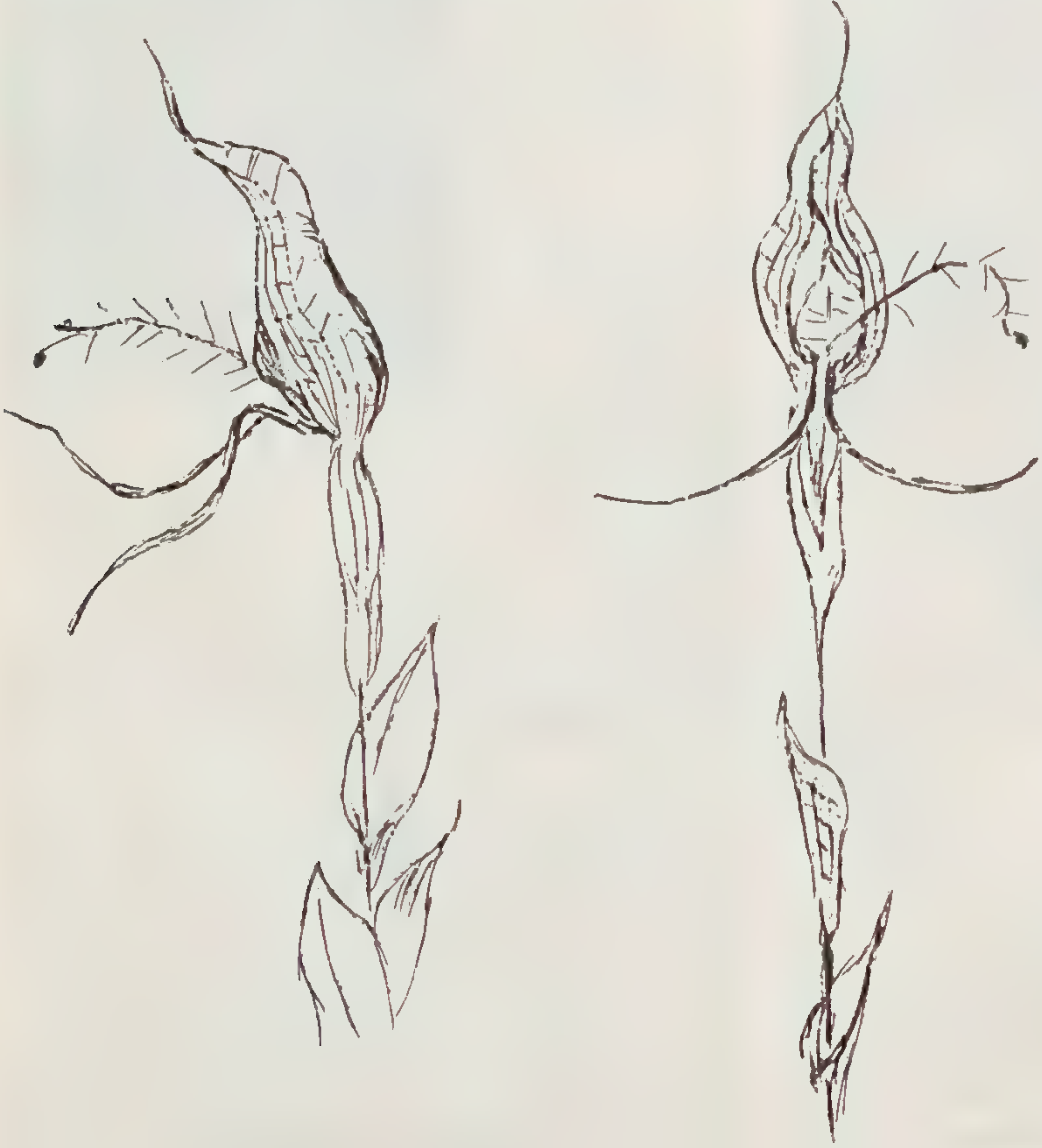


FIGURE 1:

P. barbata sketched from Nicholls (loc. cit.) Plate 345, a Western Australian plant. Flower natural size — from side and front.

(— J.J. Betts)

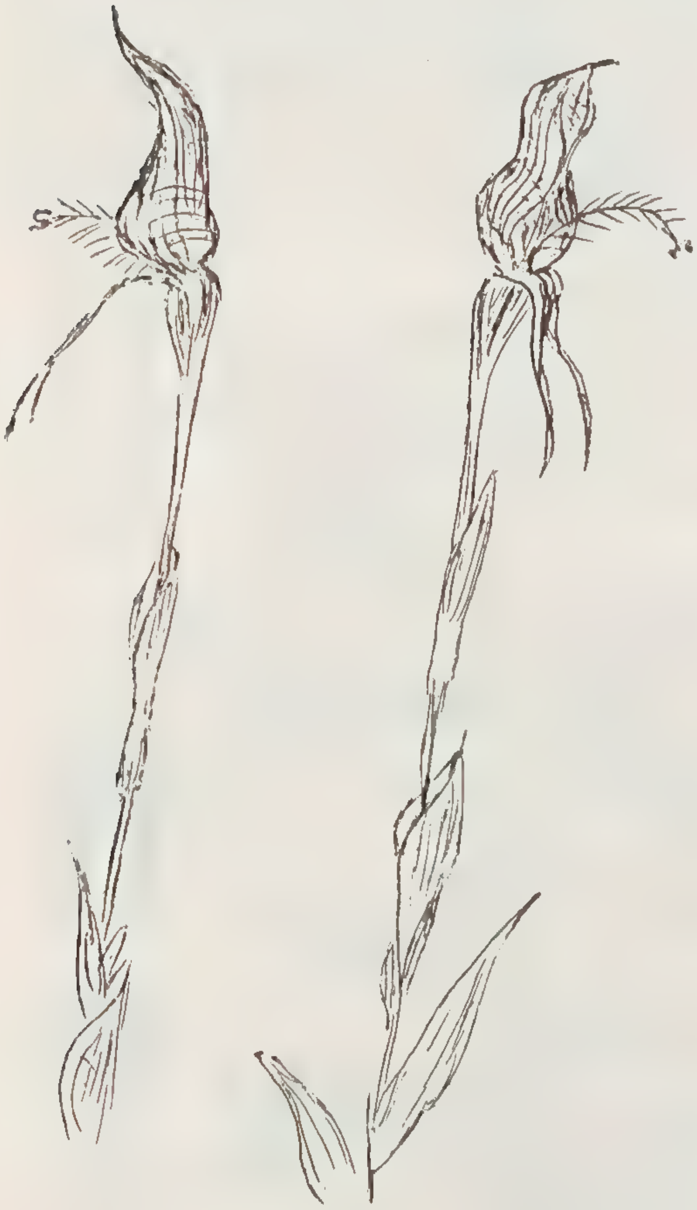
as growing in well drained areas under scrub whilst the N.S.W. distribution of Maroubra (very sandy), Bathurst or Wombeyan Caves all indicate quite dry conditions. John Firth of Tasmania comments that the species grows amongst the heath on quartzite hills or dry areas amongst eucalypts. The main common feature is plenty of shade and this would be important in considering cultivation.

Unfortunately the species are considered difficult to grow and slowly decrease in cultivation. If anyone has found otherwise could they please give us their secrets.

Lot 4, Anderson Road
October, 1979 BERKELEY VALE, NSW. 2259

FIGURE 2:

P. barbata sketched from Nicholls, Plate 346, which illustrates specimens from the eastern States (reduced in size). (— J.J.Betts)



REFERENCES:

It will be noted that Peter Vaughan at times appears to be referring to one species and at other times to two. This is because two distinct taxonomic opinions have been expressed: One by A.S. George (1961) and the other by L. Cady (1969). Readers interested in more detailed discussion may care to look at the references listed below. Nicholls, at Plate 345 illustrates a plant from W.A. — whence came the type specimen for *Pterostylis barbata* Lindl. (formerly known as *P. turfosa*). At Plate 346, Nicholls illustrates the species from the eastern states and calls this also *P. barbata*. A.S. George (1961) in adopting this view, adds: "Unless the study of fresh specimens reveals sufficient differences to warrant a new name for it". Leo Cady, in the later reference (1969) takes the view that: "These two plants are readily separated both geographically and in general appearance." Having split them into two species, Cady applied the name *Pterostylis plumosa* Cady *nov. sp.* to the species from the eastern states and New Zealand. Bates and Weber adopt the same view in *Flora of South Australia* by J.M. Black, Edition 3 (1978).

— Editor

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Nicholls, W.H.:	*Orchids of Australia* Complete Edition) 1969, p. 94
Firth, M.J.:	*Native Orchids of Tasmania* 68 (1965)
Rupp, H.M.R.:	*Orchids of N.S.W.* 101 (1943)
Black, J.M.:	*Flora of South Australia* ed. 2 : 247 (1943) and ed. 3 : 447 (1978)
George, A.S.:	*West Australian Natives* 8 : 3 (1961) *Orchids of W.A.*
Cady, L.:	*Australian Plants* 5 : 138 (1969)

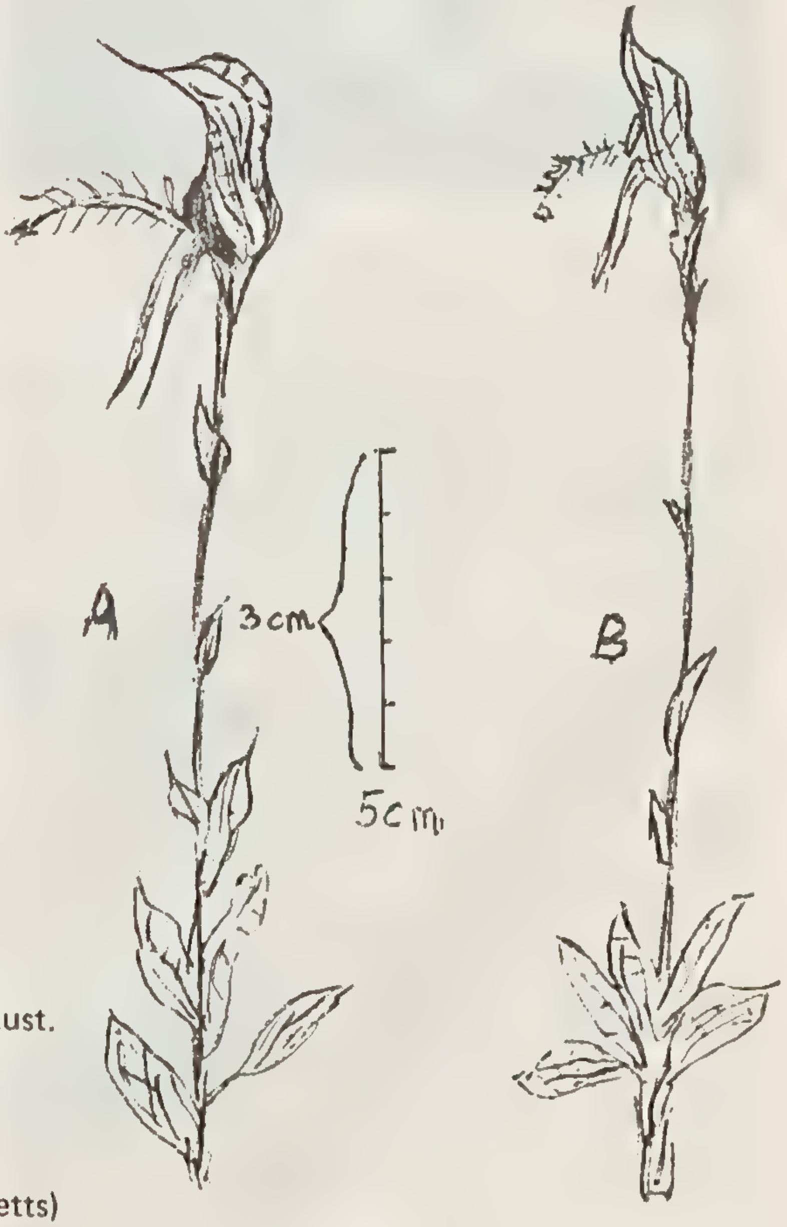


FIGURE 3:

Sketched from L. Cady's illustration (Aust. Plants 5 : 139) distinguishing
A) *P. barbata* Lindl. from
B) *P. plumosa* Cady.
(Reduced in size to scale indicated.)
(— J.J. Betts)

THE FIFTH ANNUAL SPRING SHOW OF THE AUSTRALASIAN NATIVE ORCHID SOCIETY, MONA VALE, SYDNEY

by W.T. Upton

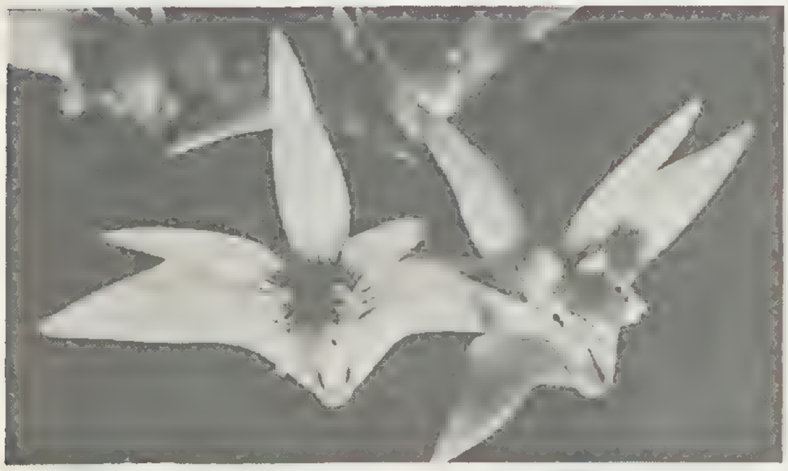
A show depicting Australian native orchids is always a pleasure to behold and the Warringah and Sydney Groups Show this year was no exception. It was held, once again, in the Mona Vale Memorial Hall, Pittwater Road, Mona Vale, opening on Friday, 14th September and closing on Sunday, 16th September.

Although overall the quality of orchids presented was not up to this show's usual standard, there were, nevertheless, many excellent plants and flowers to make one's eyes pop out.

The Champion Native Species Orchid was Peter Hind's *Pterostylis baptistii.* A well flowered group.

The Champion Native Hybrid Orchid was Murray Corrigan's Dendrobium Peter. Five 60 mm apricot coloured flowers, well displayed on the stem.

A plant that particularly appealed to me was a cross between *D. beckleri* and *D. linguiforme.* It had two upright racemes each with 9 upside down flowers about 30 mm across and slightly greenish in colour with purple striping at the base of the segments; the calli on the labellum were a bright green. We gave it third place in the class for Best Dendrobium Hybrid excluding D. kingianum parentage; but with next year's Class 11 (see next column) it should stand a first class chance of being rewarded. The hybridiser was Noel Jupp and the plant is owned by Bill Westwood.



D. beckleri x D. linguiforme Photo: W. Upton

My own specimen plant of Dendrobium Bardo Rose received the Best Specimen Plant award. It was a large plant of 621 canes and at least 6,500 flowers.

Another equally good specimen plant — *D. speciosum* owned by Chris Arnott — was an outstanding feature of the show with 58 racemes and, once again, next year it should stand a first class chance of winning a reward as we have both hybrid and species specimen champions.

Jim Walker's *Eria fitzalani* won the Best Other Species and well deserved its award being very well flowerd and presented. (See picture on page 143.)

Maybe the poor quality and the absence of many plants was due to our Show Schedule not catering for all growers and their plants. If it was, then this has already been remedied. A committee of 4 of us — our Show Marshall, Norm Hilliger and Judges Murray Corrigan, Bob Lowe and the writer have already prepared next year's schedule. We have tripled the prize money and greatly increased the number of classes so that a greater range of quality exhibits will have a chance of winning a prize which, I might quickly add, many of them have always so justly deserved. Many were previously grouped with others that came more precisely within the scope of our present judging standards and therefore did not stand a chance, although they may still have been nearer the optimum of their own species or the best of their hybrid strain.

Next year's schedule is here printed in full so that all members, not just Sydney folk, may start preparing that special plant or plants now. Good grooming and culture to ensure that a plant reaches perfect condition by show date should start now. Repot any plant as early as possible, build up the strength of the plants, and should they have an out-of-season flowering, cut the raceme off before it develops. Ensure it does not get attacked by insect pests that deteriorate the plant in so many ways. Carry out a planned watering and feeding programme — Yes, plan a military operation with Show Date as the target.

SCHEDULE FOR 1980 SPRING SHOW

SPECIAL PRICES

1	Champion Native Species Orchid	Silver Medal $15
2	Champion Native Hybrid Orchid	Silver Medal $15
3	Champion Specimen Native Species Orchid	$15
4	Champion Specimen Native Hybrid Orchid	$15

SPECIES SECTION

		1st	2nd
1	Best Dendrobium Species		
	(a) Dendrocoryne Section (refer special condition)	$6	$2
	(b) Terete Leaved Section (refer special condition)	$6	$2
	(c) Other Sections	$6	$2
2	Best Sarcanthinae Species		
	(a) Sarcochilus	$6	$2
	(b) Other Genera	$6	$2
3	Best Bulbophyllum Species	$6	$2
4	Best Other Epiphytic Species, not otherwise listed herein	$6	$2
5	Best Terrestrial Species	$6	$2
6	Best New Guinea Species	$6	$2
7	Best Group of Three Different Species	$8	$3
8	Best Group of Three *D. kingianum* — Distinct Colours	$8	$3

HYBRID SECTION

9	Best Dendrobium Hybrid with *D. kingianum* parentage, excluding *D. X delicatum*	$6	$2
10	Best Dendrobium Hybrid, excluding *D. kingianum* parentage, excluding *D. X gracillimum*	$6	$2
11	Best Dendrobium Hybrid with one or more terete leaved parents	$6	$2
12	Best *D. X delicatum*	$6	$2
13	Best *D. X gracillimum*	$6	$2
14	Best Sarcanthinae Hybrid	$6	$2
15	Best Hybrid Seedling — First Flowering	$6	$2
16	Best Group of Three Hybrids	$8	$3

NOVICE SECTION

17	Best Epiphytic Species	$6	$2
18	Best Terrestrial Species	$6	$2
19	Best Native Hybrid	$6	$2

DISPLAY SECTION

20	Best Display of Australian and/or New Guinea Native Orchids (min. 1 sq. metre embellished with native ferns and foliage, flowers excluded) A prize of $5 will be allocated to each other entry.	$15	$10
21	Best Small Display of Orchids (using max. of seven native orchids — embellished with native ferns and foliage, flowers excluded)	$10	$5
22	Best Interstate or N.S.W. Country cut flower exhibit of native orchids by an A.N.O.S. Group or member	$10	$5

FLORAL ART — OPEN SECTION

23	Orchids in a basket	$6	$2
24	Orchids and Ferns	$6	$2
25	Miniature arrangement — max. overall 3"	$6	$2

SOME BY-PRODUCTS OF THE SHOW

An orchid show is far from just the plants — It's a meeting place — a social gathering — a place of knowledge on native orchid culture — a market place (over $3,000 worth of natives and their hybrids were sold this year) — the renewing of old friendships — and just a place to talk orchids.

The tall tales of fishermen are nothing as compared to "the big flower I saw but it could not be got because a big black snake was standing guard over it" or "the biggest and darkest 'Kingy' that's ever been seen but it died when I was away on holidays". Have you noticed how the biggest and best always die! I'm sure our Editor would love to hear your 'tallest tale'.

Our Show has become quite a social event on the calendar of anyone who's anyone in the native orchid field and this year was no exception. Over 1,000 persons attended, and that's apart from the helpers, judges and exhibitors. Many members and friends from Newcastle, Wollongong, Central Coast, North Coast, South Coast and indeed interstate came along.

The show is also a place where you bring native orchids to be identified or maybe you have a plant that's a bit strange. (I was going to say, like most of us native orchid growers, but then, the exotic orchid growers are even stranger, so I won't say it, particularly as I grow exotics too.) One such incident occurred this year. David Nittam of Charlestown brought down a piece of *Dendrobium linguiforme* with the strangest of flowers, which, after a quick look through the magnifying glass, was identified as an aberrant flower form of *D. linguiforme.* Our Editor has knowledge of the history of this plant and will tell of it.*) I was privileged to bring the plant home and draw the flower and it is illustrated here.

An aberrant form is a form differing from the normal, and is not uncommon in orchids, particularly as many are going through speciation (the formation of new and distinct species).

On the plant drawn there were two racemes, one with 11 flowers and the other with 12 flowers. The peduncle was 15 mm, pedicel 4 mm, rhachis 22 mm. The flower segments were lime green, paler towards the tips. Column and anther green. Labellum green with purple spotting on side-lobes and towards the lamina, very slight spotting on mid-lobe. Three calli on labellum, large centre, one divided into two for one third to half of distance and into three calli for middle section of this. Calli pale green. Tip of labellum pubescent. Petals obovate and concave, each with approximately 3 calli on lamina, number of calli NOT constant. Pollen quite soft and waxy, four in two pairs, all the same size.

All flowers differed slightly. Two flowers without a labellum. Mentum much reduced in size in some. Petals not concave in three flowers. Anther quite abnormal in all except three flowers. The drawing shows the anther with pollinia exposed.

71 Wesley Street
November, 1979 **ELANORA HEIGHTS, NSW. 2101**

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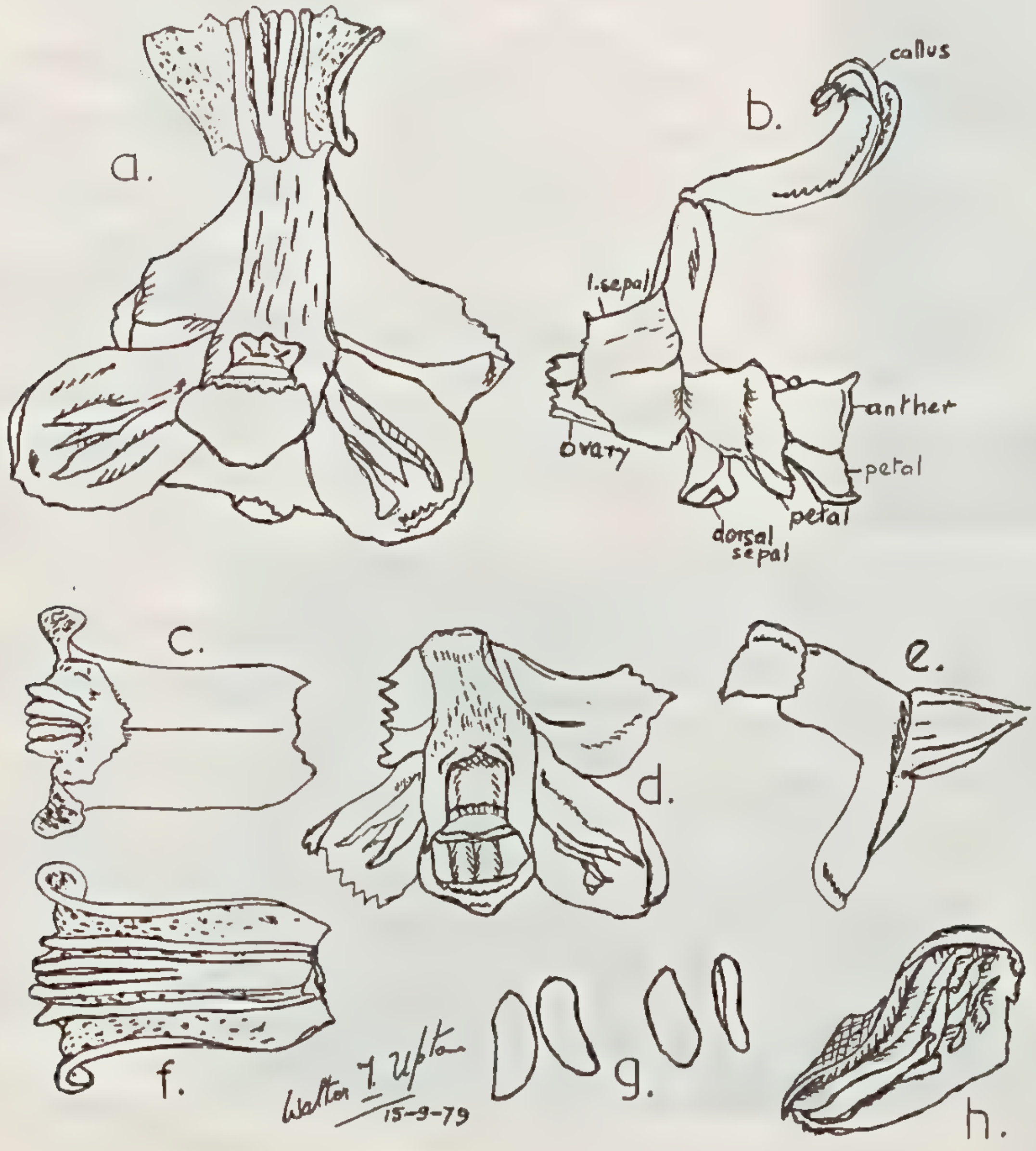
*) See page 122 and fig's 3 & 4 page 142 (photographs by Phil Collin September, 1976).



KEY TO DRAWING: –

- (a) Flower from front
- (b) Flower from side
- (c) Labellum from underneath
- (d) Looking down into column showing stigma and exposed pollinia
- (e) Column from side
- (f) Labellum from above
- (g) Pollinia
- (h) Petal from side/front showing calli on lamina and a keel on the reverse side.

Dendrobium linguiforme Sw.— A MUTATION

(The history of the plant discussed by W.T. Upton in this issue.)

by J.J. Betts

In September 1976, while visiting the Riverdene Nurseries of Noel and Virginia Jupp at East Gresford, N.S.W., my attention was directed to a vigorous plant of what appeared to be a normal *Dendrobium linguiforme,* except for the flowers. Noel Jupp told me that he had had this plant for some time and had given pieces to various experts in the hope of getting a botanical judgement on it — so far without result. The plant structure was clearly that of *D. linguiforme.* The flowers were startlingly different. This is best shown by comparing the following:

FIG. 1: Normal flowers var. *D. linguiforme*

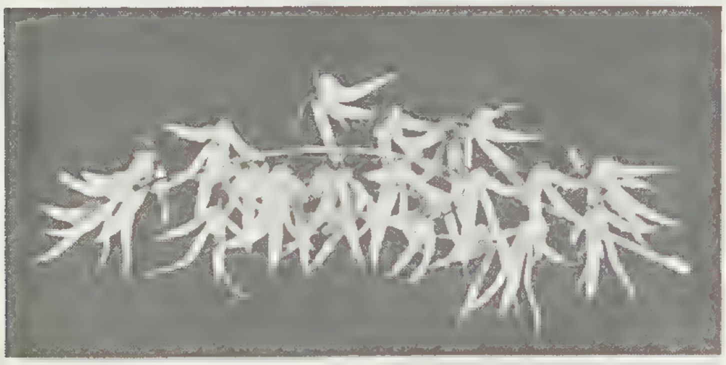


FIG. 2: Close-up flower of var. *D. nugentae*

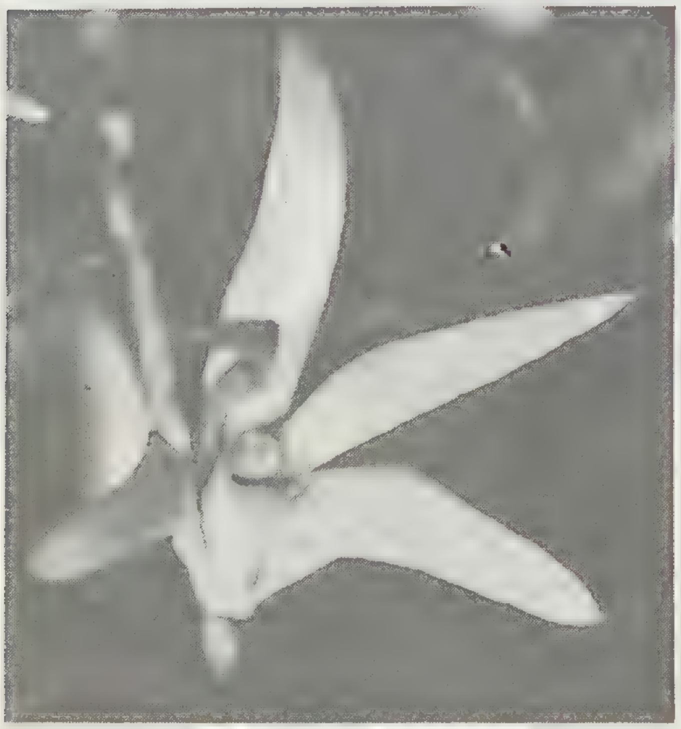


FIG. 3: Flower of mutation — Labellum in upright position

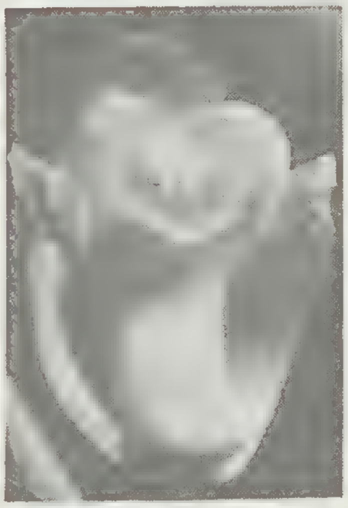
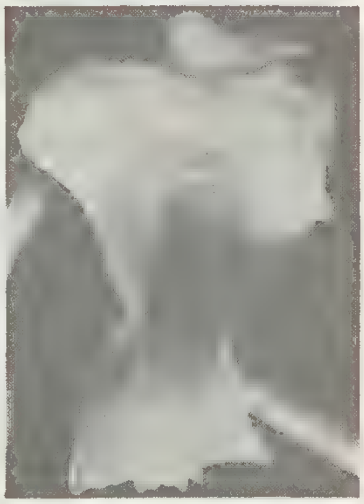


FIG. 4: Flower of mutation — Labellum in downward position



PHOTOS: G. Wells (figs. 1 & 2), Phil Collin (figs. 3 & 4)

I agreed to take a specimen for examination by Mr D.F. Blaxell at the Sydney Herbarium. Mr Blaxell was given the necessary specimens and photographs for Herbarium records and he explained the necessary additional data that would be needed to establish positive scientific conclusions. For example the key factors to be determined would include: location of the plant in its natural state; whether it was an isolated occurrence or whether other plants had been (or could be) found; whether its form was constant from year to year; whether it could be propagated by "selfing", and if so, whether the unusual form would pass on to the progeny, and so on. On the basis of such data, it should then be possible to say whether the subject plant exhibited a mutation which persisted as a hereditary variation; whether there had been a random natural mutation in the genetic system (of either genes or chromosomes) or through the agency of artificial chemical alteration (e.g. by irradiation or application of reactive chemical substances). It is often said of the orchidaceae that speciation (evolution of species) is still going on. Could this be an example of this process? If so, it would seem that the mutation would have to be beneficial — in the sense that continuation of the new species would be facilitated in some way by the new structure of the mutation.

In the 12 months following Mr Blaxell's advice, it was possible to provide the following data: —

- No more than one specimen had been found (at Iluka, north coast of N.S.W.)
- The plant produced the same aberrant inflorescences repeatedly from year to year — with varying abnormalities from flower to flower.
- Very many attempts to pollinate the flowers (by Noel Jupp and others) all failed to produce seed pods.

So far, therefore, it seems that the mutation is an isolated case and is not "beneficial". Not only are the flowers far less significant than those of the normal plants, but also they appear incapable of reproduction and hence of establishing a separate species.

Perhaps the only other interesting feature of this discovery is the posture of the labellum. During our initial examination, and when Phil Collin was photographing the inflorescence it was noticed that some flowers had a reflexed labellum leaving the column fully exposed. (Compare figures 3 & 4).

This provoked the question whether those with the labellum set downward had been visited by an insect large enough to displace the labellum. More careful study would have indicated whether this was so or whether the flower had adopted this posture on initial opening.

We are grateful to Mr Upton for the detailed drawings and observations made during this season. They confirm the persistent teratological nature of the plant studied — ("All flowers differed slightly. Two flowers without a labellum . . . Petals not concave in three flowers, etc.").

Although there seems no future for this plant, it is vegetatively vigorous and one wonders whether as it goes on growing and producing its varying monster-flowers each year, it may eventually "sport" just one variation that will open the gateway to effective pollination and hence to a beneficial or efficient new form.

The moral of this incomplete story is: if you find something strange, do not be shy about reporting it to your State's Herbarium for botanical assessment.

November, 1979 **— EDITOR**

Who's Who

THE AUSTRALASIAN NATIVE ORCHID SOCIETY OFFICERS AND GROUP CONTACTS:

ANOS Council:

President: J.A. Walker; Vice-President: E. Gordon; Secretary: D. de Silva; Asst. Secretary: Mollie Shelley; Treasurer: R. Calkin; Editor: J.J. Betts; Asst. Editor: P. Weston; Councillors: P. Collin, M. Harrison, F. Martin.

ANOS Group Officers and Affiliated Societies:

NEW SOUTH WALES:

- *Sydney Group:* President: J. Walker (Tel.: 419 2529)
  Meets 8 p.m. 2nd Friday each month, Ryde School of Horticulture, 59 Parkes Street, West Ryde.
- *Warringah Group:* President: E.G. Gordon (Tel.: Business: 764 2215, Home: 939 6726)
  Meets 8 p.m. 2nd Thursday, Stony Range Flora Reserve, Pittwater Road, Dee Why.
- *Newcastle Group:* President: W. Moloney, 11 Crestwood Place, Warners Bay, 2282. Secretary: Mrs Judy Parker, 68 Mills St., Warners Bay, 2282 (Tel. 48 9109). Meets 4th Wednesday, John Young Community Hall, Thomas St., Cardiff.
- *Wollongong and District:* Secretary: Mrs E. Beileiter, 19 London Street, Berkeley, 2506.
  Meets 2nd Tuesday at the Meeting Room of the Wollongong Town Hall.
- *Hastings Valley Group:* Secretary: Mrs N. Blanch, R.M.B. 60, Pappinbarra Road, Beechwood, 2446.
  Meets 7.30 p.m. 4th Friday at Beechwood Uniting Church Hall.
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- *Cumberland Orchid Circle (Affiliated):* Secretary: Rayden Rivett, 33 Woodlands Street, Baulkham Hills, 2153 (Tel.: 639 4156). Meets 4th Wednesday.
- *Central Coast Group:* Secretary: Mr Ross Worrell, 6177 Oliver Road, Lisarow, 2251. (Tel.: 24 4435)
  Meets 7.30 p.m. 2nd Wednesday at the Teachers Resource Centre, Georgiana Terrace, Gosford.

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- Secretary: Mrs R. Wootton (Tel.: 754 6585).
  Meets 8 p.m. 1st Friday at the National Herbarium, Royal Botanic Gardens, Melbourne.

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- *Darling Downs Group:* Secretary: Mrs J. Leyden, 66 Mort St., Toowoomba, 4350.
  Meets 7.30 p.m. 3rd Friday at the Auditorium of the Technical & Further Education Centre, Old Empire Theatre, Neil Street, Toowoomba.
- *Native Orchid Society of Queensland (Affiliated):* President: Dr P.S. Lavarack; Secretary: Mrs V. Swaffer, c/- P.O. Box 159, Broadway, QLD. 4000. Meets 8 p.m. 1st Monday at Bread House, 49 Gregory Terrace, Brisbane.

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- *Native Orchid Society of South Australia (Affiliated):* Secretary: E.R. Hargreaves, (Tel.: 293 2471 or 297 3724).
  Meets 4th Tuesday, Goodwood Boys' High School, Hardy Street, Goodwood, Adelaide.
- *Northern & Eastern Districts Orchid Society (Affiliated):* Secretary: W.G. Joffre Keen, 22 Campbell Street, Oaklands Park, South Australia 5046.

WESTERN AUSTRALIA:

- *W.A. Native Orchid Study and Conservation Group (Inc.) (Affiliated):* Committee Member: Ms L. Penny, Unit 6, 63 Fourth Avenue, Mt. Lawley, W.A. 6050.
  Meets 1st Friday at the Department of Agriculture's Film Room, Jarrah Road, South Perth.

NORTHERN TERRITORY:

- *The Orchid Society of the Northern Territory (Affiliated):* President: Mrs R. Bromwich (Tel.: 81 2035); Secretary: Mrs G. Heinemann (Tel.: 85 4624), P.O. Box 38493, Winnellie, N.T. 5789.

Jim Walker's *Eria fitzalani* (Photo: G. Wells)

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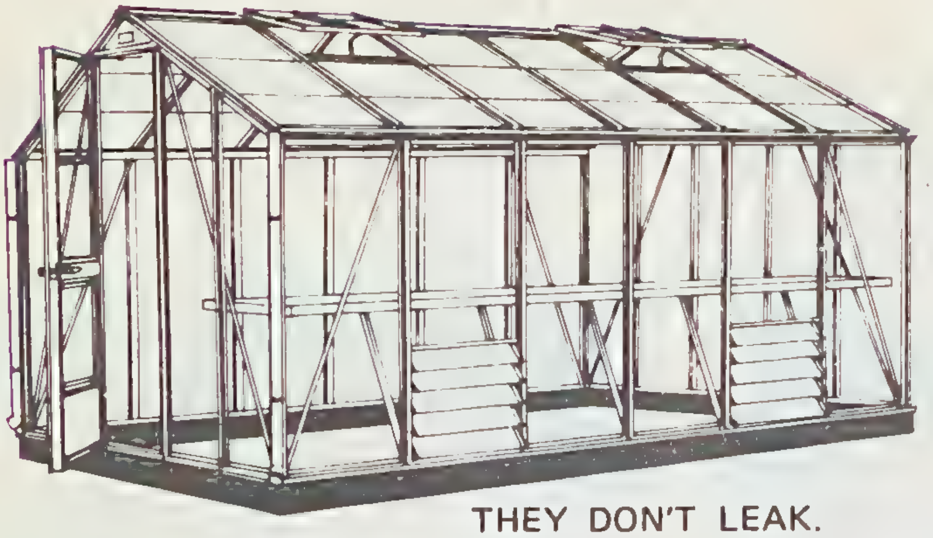

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MARCH, 1980

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Date this issue distributed:
15th April, 1980

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- Three new species of the Ceratobium Section (Dendrobium) from Papua New Guinea, by Dr P.J. Cribb of the Kew Herbarium.

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THE ORCHADIAN

Founded August, 1963

Editor: J.J. Betts
Honorary Associate Editors: Dr N.J. Grundon (Qld.), Mr J. Simmons (S.A.)

Volume 6 March, 1980 No. 7

EDITORIAL

In this issue, among other good things, is a brief description by Dr P.S. Lavarack of the habitat of the Australian form of *Dendrobium antennatum* Lindl. with photographs of the plant in flower and the habitat as well as a map. Those readers who have *D. antennatum* in their collections will, most probably, have one of the New Guinea forms of this orchid and in view of Dr Lavarack's comment that "the Australian plants are relatively large flowered" in comparison with the New Guinea forms "and make an excellent horticultural subject", I include here a close-up of an Australian flower photographed by Garry Wells in the collection of Steve Clemesha.

Close up *D. antennatum* (Australian form)
Photo: Garry Wells

Ted Gregory speaks again in this issue with some very welcome notes on a familiar species. He has discontinued his seasonal notes for the present but will be writing, as the mood takes him, on various north coast epiphytes and their habitats. As he becomes more established in his own new habitat, perhaps the emphasis may shift to the S.E. Queensland scene ?

Last, but far from least, in the present issue the President of A.N.O.S., Jim Walker, announces a National Award which should prove to be **the** most prestigious accolade for Australian native orchid growers. Do not fail to grasp the significance of this award and keep for reference the conditions and judging standards to be applied. The review of A.O.C. awards by David Banks goes well with this announcement of A.N.O.S. plans (pp 165-6).

FEEDBACK & FOLLOW-UP

- There is egg on the face of A.N.O.S. Council. Advertisements placed in the monthly journal "Your Garden" showed the A.N.O.S. membership subscription as $5 p.a. instead of the current $7.00. I believe that while it is gratifying to have so many new subscribers from this source, it is not so pleasing for the Hon. Secretary to have to deal with the puzzled enquiries from members renewing their subscriptions.
- From February, 1980, following the resignation of Ross Calkin as Hon. Treasurer, Council has appointed Erhard Husted to that important post. Erhard also makes his debut as a contributor in this issue at p. 151.
- On reading my reference to David Banks's review of A.O.C. awards for Australian native orchids, Les Nesbitt has offered to give us similar material on State awards in South Australia from the Orchid Club of S.A. Members in other States may care to follow this lead. See the invitation by David Banks at p. 166.
- *Corrigenda:* Dorothy Woolcock has pointed out some errors in the captions to Collin Woolcock's fine drawings at p. 103 of the September, 1979 issue. *Caladenia pattersonii* should read *patersonii; C. irridescens* should read *iridescens* and *C. clavata* should be *C. clavigera.* Full marks if you noticed all these at first glance, as I did for the first two — unfortunately too late. If you got 2 out of 3 you may care to volunteer as a proofreader ? The beauty of Collin's drawings could easily distract your attention of course. (See p. 159 this issue.)
- With this issue we enclose a "car windscreen sticker" for use by members. Maybe you don't go for badges but remember that the A.N.O.S. badge on your widscreen could attract new members. The sticker was donated by the Sydney and Warringah A.N.O.S. Groups.
- What about colour ? No, we still cannot afford it.

NEW AUSTRALIAN ORCHID HYBRIDS

Omitted from our listing at p. 116 (September, 1979) were the following hybrids registered with the R.H.S. in April, 1979.

Dendrobium Wonga *(D. speciosum* x Hastings)
— by W. & J. Cannons
Dendrobium Delicate Falcon
(D. falcorostrum x delicatum) — by D.M. Cannon

TENTH WORLD ORCHID CONFERENCE

Word from Jim Simmons (NOSSA) reveals that the "Pilot Scheme" for exhibiting Australian terrestrial orchids in Durban in September, 1981 is away to a good start. About 150 tubers of some 17 species have been sent from Adelaide to Durban for cultivation by host members there on behalf of NOSSA and the proposed ANOS exhibit. Epiphyte growers in N.S.W. & Queensland might please plan early for the epiphytic part of the display and let ANOS have your ideas.

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Native Orchids of New Zealand
7 – *Dendrobium cunninghamii* Lindl.

by Dorothy Cooper

The genus Dendrobium is a large and diverse one in Australia with approximately 60 species, but it is represented by only a single endemic species in New Zealand, *Dendrobium cunninghamii.* It has the largest flower of our epiphytes, 2—2.5cm in diameter, and is found throughout New Zealand, Stewart Island being the southernmost occurrence of the genus.

It is usually epiphytic on trees, often out of reach on high branches in rain forest and wet mountains, but also occurs on rocks — even near the coast, and on stony ground in well lit places, usually beneath beech *(Nothofagus)* trees. The rhizome gives off branching roots which soon form a dense mat.

Its long erect or pendulous branches have the usual Dendrobium cane-like form, but are very slender, hard and brittle, and much branched, the numerous lateral divisions at approximate right angles, giving a very spread out effect. Stems are glossy brown or shiny yellow on lower leafless parts and are up to 120cm long.

The sessile leaves are 3.5cm by 3mm, broadest near the base and occurring alternately along the stem. They are leathery and yellow-green, with overlapping tubular sheaths.

The main flowering season is from December to February. The prominent white flowers are scattered sparsely over the plant, usually in pairs, but sometimes singly and occasionally in threes or more, the buds having a distinctive form. Two or three tubular floral bracts are present at the base of the long slender flower stalk. Flowers are borne on short laterals, the perianth segments are approximately equal in length, the labellum being slightly smaller. Lateral sepals are joined beneath the labellum, and united with the swollen base of the column; their tips are slightly recurved.

The broad labellum has a short elastic claw and is 3-lobed. The two small lateral lobes turn up and are usually strongly coloured purple or pink. The midlobe has elevated longitudinal ridges or plates which are yellow-green, sometimes with reddish crests. Basal calli are sometimes present.

The flowers do not seem to be capable of self-pollination. The greenish column is prominent. It has wings near the top and has purple markings, especially on its underside. The terminal anther has 4 waxy pollinia, 2 per cell. The large green stigma is high on the column, while the column base has a large swollen bulge, shiny green in colour, which seems to be some sort of nectary as drops exude out at its base. An insect landing on the labellum can reach this nectar but at the same time is pressed against the sticky rostellum. The pollinia are very easily withdrawn by an upward movement.

The large green seed capsules split when ripe at their anterior ends only. Having scattered seed liberally in several pots last year, I am eagerly awaiting the appearance of seedlings.

10 December, 1979

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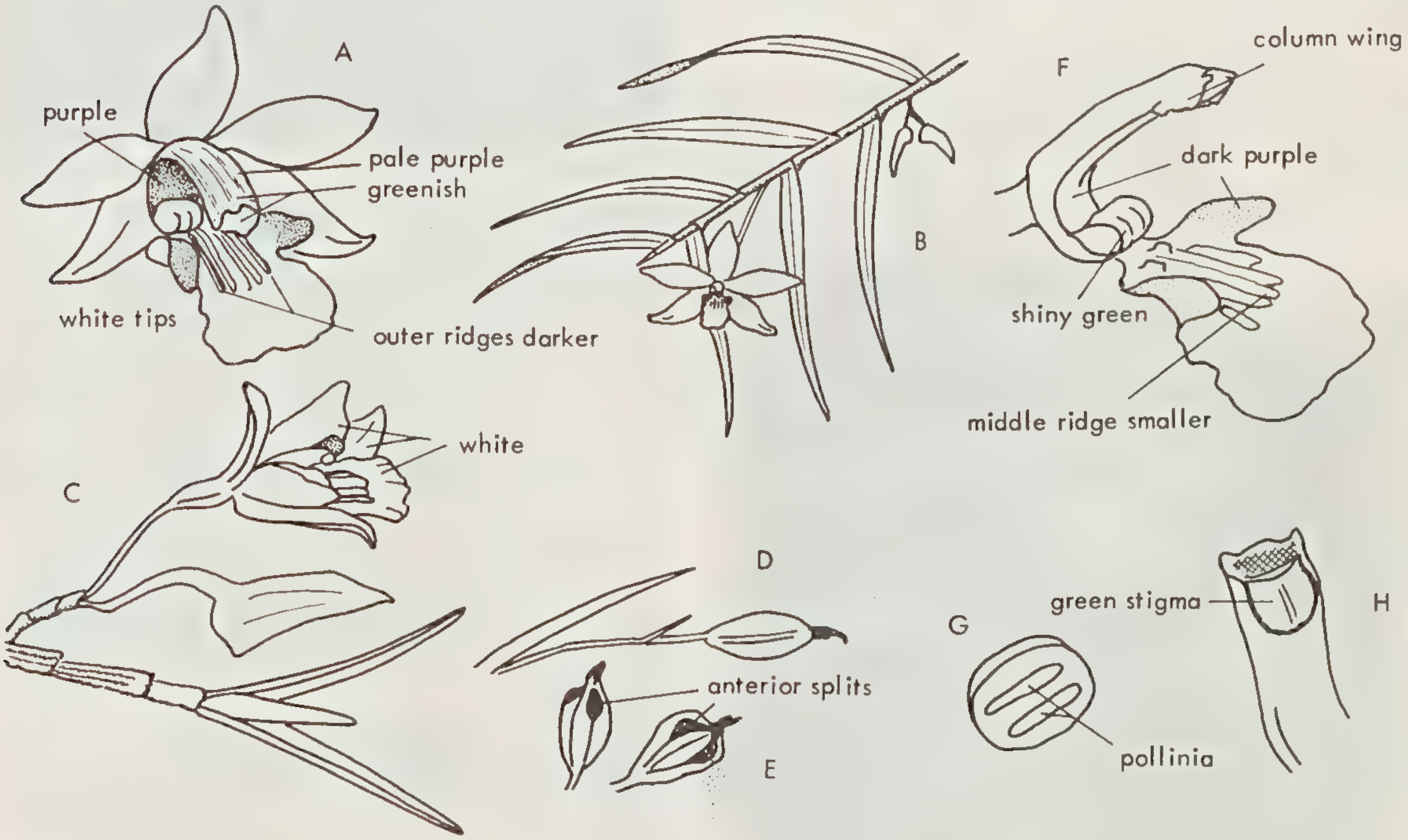


Dendrobium cunninghamii Lindl.

A Flower enlarged
B End of branch, approx. natural size
C Flower, bud and tip of branch
D Seed capsule
E Ripe seed capsules
F Detail of column and labellum
G Anther cap
H Column, anther cap removed

Drawing: Dorothy Cooper

DENDROBIUM ANTENNATUM LINDL. IN AUSTRALIA

by P.S. Lavarack

Recently the occurrence in Australia of *Dendrobium johnsoniae* and *D. ophioglossum* has been seriously questioned. (See Orchadian Vol. 6, No. 2, p. 34 and Vol. 6, No. 5, p. 109.) It would seem unlikely on the evidence available that either of these widespread New Guinea species does occur in Australia. It would be tempting to place *Dendrobium antennatum* in the same category, but the aim of this discussion is to record observations made on the occurrence of this species on Cape York Peninsula.

F.M. Bailey recorded this species for Australia on the authority of F. Mueller but expressed doubts as to the real origin stating:

> "*D. antennatum, D. johnsoniae* and *D. fitzgeraldi* *) are given as Queensland species in Baron Mueller's second annual supplement to the 'Systematic Census of Australian Plants' but it is more probable that they belong to New Guinea and the South Sea Islands, and have reached that botanist by way of Queensland" (Bailey 1886).
>
> *) *Dendrobium fitzgeraldi* is now regarded as *D. X superbiens.*

He subsequently omitted *D. antennatum* from the orchid part of "The Queensland Flora" (Bailey 1902). Mueller, however, persevered and listed this species in his "2nd Systematic Census of Australian Plants" (Mueller 1889). The next reference was by Rupp and Hunt (1948), who said that Mueller's record was ". . . probably a mistake. He gave no locality and there are no Australian reports of the species."

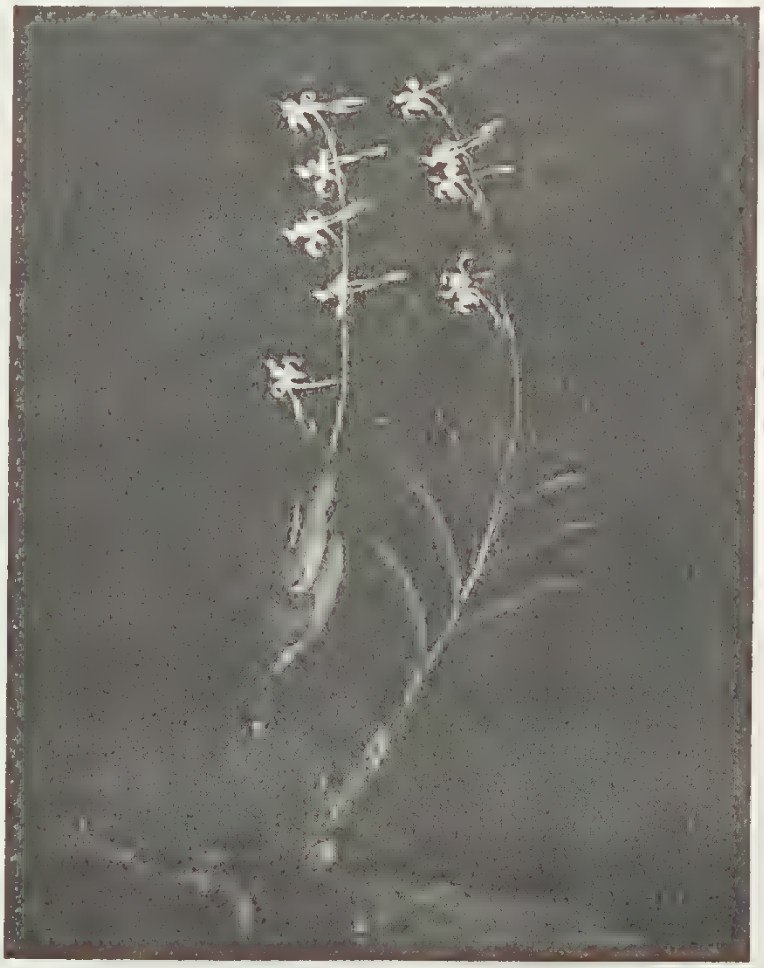
The first definite record for Australia was a specimen collected in the Massey Scrub near Coen by L.J.H. Wassell in 1955 and subsequently recorded by Dr S.T. Blake (1963).

Other plants were apparently collected a few years later from the Rocky River area of the McIlwraith Range and, while several of these found their way into collections, there does not appear to be any herbarium material.

The Australian habitats of *D. antennatum:*

The present writer has encountered plants of this species on three different field trips, but always in similar habitats. It occurs on the steep, fast-flowing streams that flow from the 800m high McIlwraith Range to the coast. It is almost invariably found where the streams drop over a waterfall or series of steep rapids and where the rocky topography has forced a break in the canopy. The conditions then are exposed, with high light, but also high humidity. They are not plants of dark rainforests.

Chester River Gorge
habitat of *D. antennatum* Photo: P.S. Lavarack


Dendrobium antennatum Photo: P.S. Lavarack

D. antennatum has been observed along the Massey, Rocky, Chester and Leo rivers and probably also occurs on Capsize Creek in the upper reaches. It is not in danger of over-collection as it occurs in areas with no road access and can be reached only after at least one to two days walk. To my knowledge it has not been seen at Iron Range or further north.

The Australian populations seen show very little of the variation which is characteristic of the species in New Guinea. Compared with New Guinea forms the Australian plants are relatively large-flowered and make an excellent horticultural subject.

It is now generally accepted that *D. d'albertisii* Reichenb.f. is a synonym of *D. antennatum* Lindl., the plants originally described as *D. albertisii* from southern Papua being a rather small-flowered form of *D. antennatum.*

REFERENCES:

BAILEY, F.M. (1886)	Syn. Qld. Fl. Suppl. 1. 54-55.
BAILEY, F.M. (1902)	The Qld. Flora. Part V.
BLAKE, S.T. (1963)	New or Noteworthy Plants chiefly from Qld. *Proc. Roy. Soc. Qld. 73* (5) P. 65-66.
MUELLER, F. von (1889)	"Second Syst. Census of Aust. Pl."
RUPP, H.M.R. and HUNT, T.E. (1948)	A review of the genus Dendrobium in Australia. *Proc. Linn. Soc. NSW 72* (5-6) P. 233.

14 November, 1979

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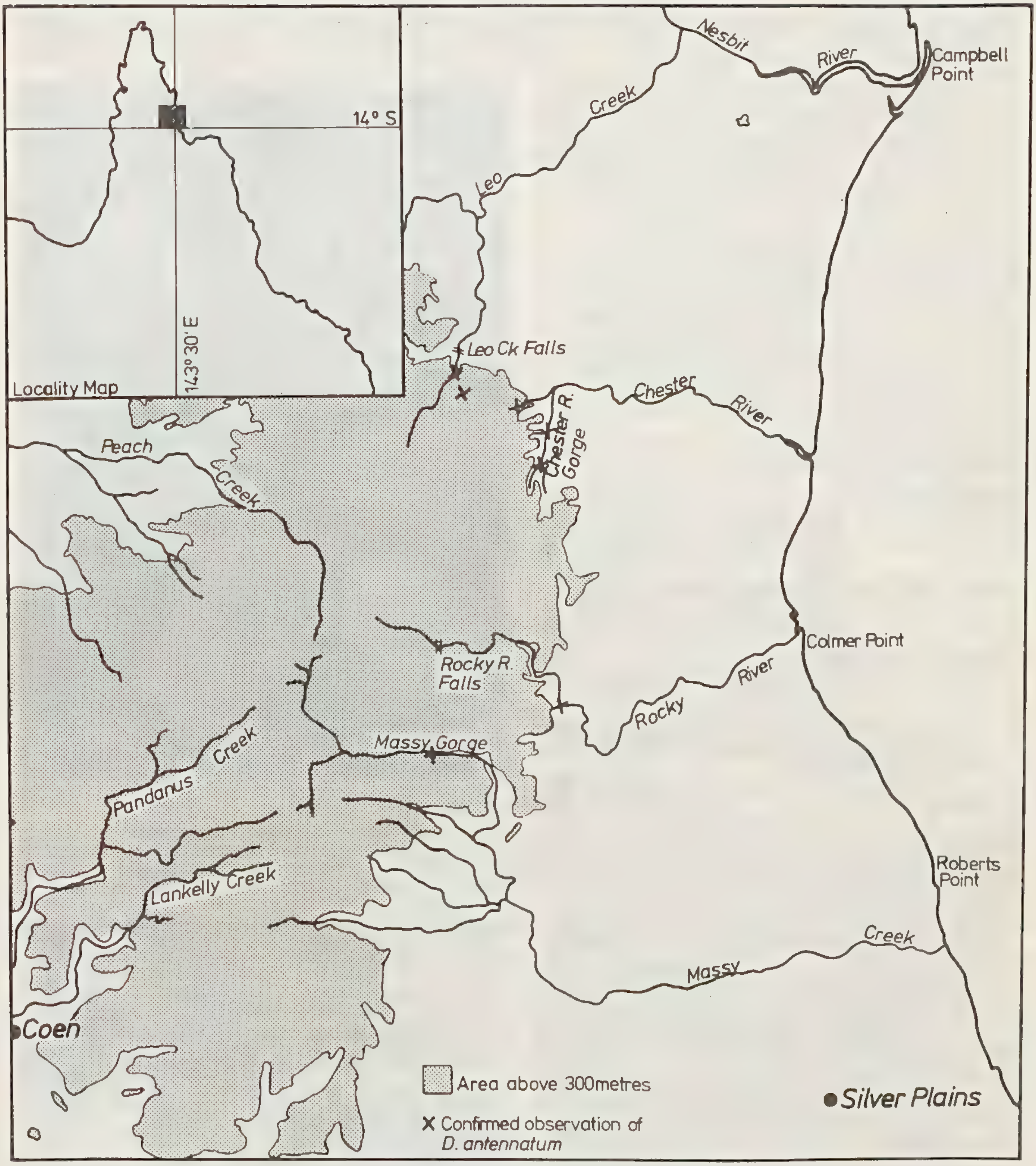

. Map showing the occurrence of *Dendrobium antennatum* Lindl. in Australia

Scale in kilometres

THE GENUS ARTHROCHILUS IN PAPUA NEW GUINEA

by Dr P.S. Lavarack

Arthrochilus irritablis F.Muell. was first recorded for New Guinea under the synonym of *Drakaea irritabilis* (F.Muell.) Reichb.f. by L.O. Williams in 1946. This was based on a specimen collected by L.J. Brass (Brass 8722 Jan. 1937). This specimen was collected at Tarara, Wassi Kussa River, Western District and the notes on the label read "Savannah-forests; occasional on wet flats". The author was able to examine duplicate material of this collection in Brisbane Herbarium and is satisfied that this identification is correct. A search in Lae Herbarium yielded no other records of this species.

However, the search at Lae did turn up a specimen labelled "*Spiculaea* sp." collected by R. Pullen No. 7216, LAE 11509, 31/8/1967 from 1 mile south-east of Morehead Patrol Post, Western District. Unlike the Brass specimen quoted above, individual plants on this sheet all had a single long, narrow leaf. A careful study of these specimens satisfied the author that they represented *Arthrochilus dockrillii* P.S. Lavarack. *

It is apparent that two species of Arthrochilus occur in Papua New Guinea, both in the Western District. *A. irritabilis* F.Muell. has a rosette of leaves, usually not present at flowering and which are less than half the length of the inflorescence. It is widespread from about Sydney to Cooktown in eastern Australia. *A. dockrillii* P.S. Lavarack has a single leaf or occasionally a pair of lanceolate leaves about as long as the inflorescence and almost invariably present at flowering time. It is a common plant of sandy areas on the east coast of tropical Queensland from about Tully north to Cape York.

A full key to the species of Arthrochilus is given in Lavarack, 1975. (Reference below.)

REFERENCES:

Blaxell, D.F., 1972 *Arthrochilus* F.Muell. and related genera (Orchidaceae) in Australasia. (contrib. N.S.W. Nat. Herb. *4* : 275-283)
Lavarack, P.S., 1975 *Arthrochilus dockrillii:* A new species of Orchid from North Queensland. *Proc. Roy. Soc. Qd.* 86(25): 155-6
Williams, L.O., 1946 Orchidaceae Novae Guinea 1 *Bot. Mus. Leafl. Harv. Uni. 12* (5):149-178

* See *The Orchadian* Vol. 5, No. 11 (March, 1978) pp 166-167 ("Recent Discoveries in North Queensland" by P.S. Lavarack).

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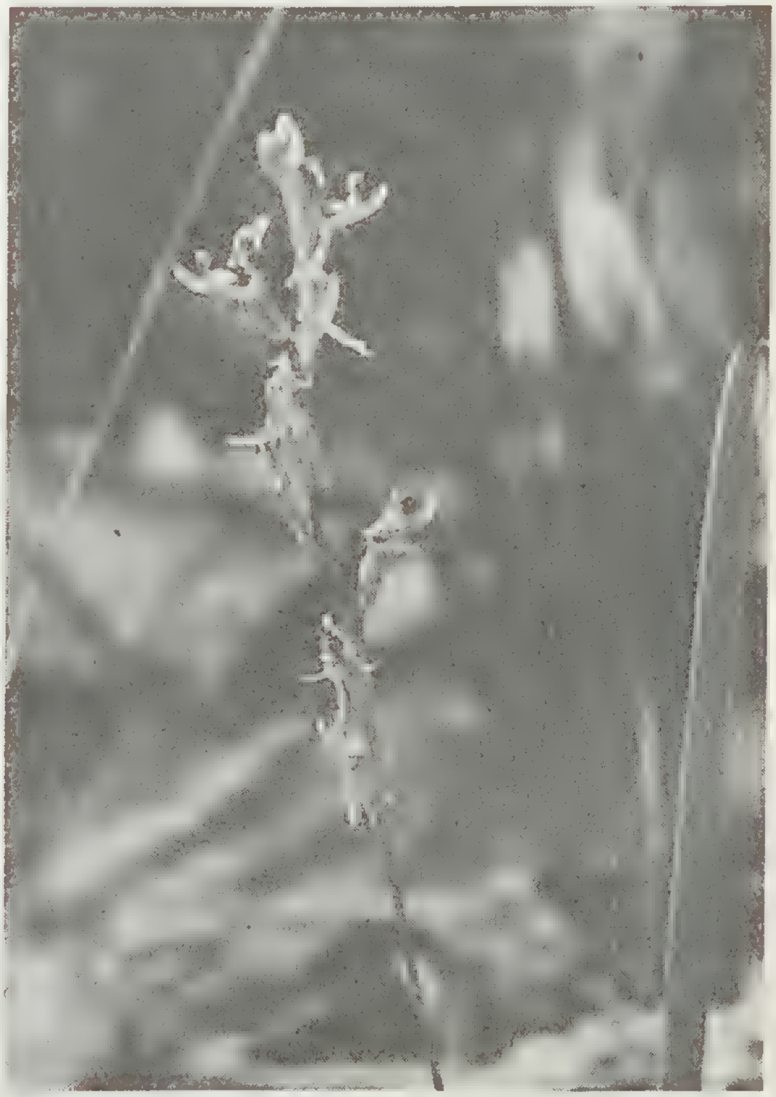
11 December, 1979



Arthrochilus dockrillii Photo: P.S. Lavarack

EDITORIAL NOTE: For readers interested in the genus *Arthrochilus* it should be noted that illustrations appear in Nicholls's *Orchids of Australia* (Complete edition, Nelson, 1969) at plates 183-184 and in Dockrill's *Australian Indigenous Orchids,* pp 199-201, and in Rupp's *The Orchids of N.S.W.* pp 42-43. The close relationship of *Drakaea, Spiculaea* and *Caleana* is discussed by Rupp who quotes Dr R.S. Rogers on the subject. In all of these works *Arthrochilus* is referred to as *Spiculaea* with which it is synonymous.

THE AUSTRALIAN ORCHID FOUNDATION

The latest information from the President of the AOF was received shortly before he joined the Cape York Orchid Project (Iron Range Wet Season Survey) which commenced on 21 February, 1980. Organised by the National Parks and Wildlife Service of Queensland and financially assisted by the AOF, this expedition, led by Dr P.S. Lavarack (N.P.W.S.) comprises the following members: J. Clarkson (Queensland Herbarium), M.W. Hodge (wildflower photographer), L. Lawler (Sydney University) and G. McCraith (President AOF).

New records are expected for the following genera: *Nervilia, Pterostylis, Habenaria, Malaxis, Calochilus, Didymoplexis, Prosophyllum, Aphyllorchis* and *Eulophia.* However, there is no guarantee what new discoveries will be made, especially as it is impossible to forecast accurately the flowering time for these genera. The epiphytic orchid flora of the area is considered to be well known already, so terrestrial orchids will be the prime objective.

Translation of Rudolf Schlechter's work on New Guinea Orchids: This is a project taken over by the AOF from ANOS (see credits in our Editorial, page 178, Vol. 5, No. 12 of June, 1978). The AOF now reports "good progress" with the typing of the translation by Dr R.S. Rogers and also that Mr D. Blaxell will be the guiding hand with the complex project of filling out those parts not translated by Dr Rogers and obtaining permission to print "a limited number of copies". Unfortunately for those eagerly awaiting the outcome of this project, the AOF regards it as "a long range project because of the amount of exacting and detailed work that is involved". I can assure any impatient readers, however, that Mr Jim Simmons, our Associate Editor for South Australia, is doing everything possible to speed this project in his dual role as member of the AOF and of ANOS.

Other Projects:

(a) An expedition is being considered for the Israelite Bay area of W.A. (search and survey for terrestrial orchids in the first three weeks of August, 1980). This is to be a joint project by the National Botanic Gardens, Canberra and staff of the W.A. Herbarium.

(b) Orchid Workshops in Adelaide (May) and Melbourne (August). "Progress has been smooth". Although not mentioned, we understand there will be another N.S.W. Workshop in September.

(c) The AOF Seed Bank is reported as urgently in need of more seed to build up its stock for distribution. (See past issues of *The Orchadian*).

— EDITOR, March, 1980

FIRST ENCOUNTERS WITH TERRESTRIAL ORCHIDS OF THE SYDNEY REGION

by Erhard Husted

Until recently I had not even considered growing terrestrials, being quite content to grow epiphytic orchids. Then it happened; at a meeting of the Sydney Group there they were in all their charm, enticing me to grow them. My first effort to locate them was in June/July of this year (1979).

We had been told of a location where they grew (Sydney Metropolitan area). A friend had been to this area before me for a quick look and had literally fallen on to a colony of *Acianthus fornicatus* growing in rich bush soil. He took me to the area, stood me in front of the colony and said: "Where are they?" Not really knowing what I was looking for I could not see them until they were pointed out, they blended into the surrounding area so well.

We decided to explore further and try to locate other types. Not being familiar with terrestrials we quite possibly missed other types but managed to locate a form of Pterostylis. This was in several areas and was found growing on rocks in deep moss, against rocks in hard soil and also in bush mulch with a thick covering of leaves. Lots of colonies of Acianthus were found. It was noted that the plants growing in the bush mould had very long roots coming from the bulbs due, we assume, to the bulbs being continually buried beneath layers of leaves. This occurred with both types of terrestrials.

Epiphytic species found were *Dendrobium linguiforme, Dendrobium striolatum, Cymbidum suave* and *Liparis reflexa.*

I have been back to this area several times now and have located the following terrestrials: *Caladenia testacea, Calochilus* (with red beard), *Cryptostylis erecta, Caladenia carnea.*

All the above species were found near our first finding of *Acianthus fornicatus* growing in thick moss in filtered sunlight. As it had not rained for some time the moss was very dry but the plants were still thriving. Another group of *Cryptostylis erecta* was growing on a rock outcrop in very rich, sandy soil with a generous covering of bush mulch. This group was very well advanced and had the flower stalks starting to come through.

I decided to make a monthly visit to areas of interest and thus learn to identify my finds. The various species, their locations and growing conditions had caught my interest and I felt that they could become an obsession.

All around the Sydney Metropolitan area are pockets of bushland waiting to be explored and reported on. Lots of these areas will fortunately be preserved as nature reserves and the like, but lots more will disappear with progress and with their going, so will the orchids; both terrestrial and epiphytic types. To see orchids in their natural state is very rewarding and can be of great benefit in establishing similar conditions for your collections. Just to find them is an experience that is different in each and every one of us.

Three areas of bushland had my attention over the succeeding few months: —

Area One is covered in young timber close to a river and could be classed as lightly timbered. Several types of terrestrials were found.

Evidence suggests that rabbits abound in the area and are ravenous feeders. Numerous Acianthus-type leaves had the flower stalk nipped off. So a definite identification could not be made. I have assumed them to be *Acianthus fornicatus.* Two types of Pterostylis, one being *Pterostylis pedunculata* I think. *Caladenia carnea* was found, numerous white ones with a scattering of pink forms.

Isolated pockets of Cryptostylis species were found usually at the base of a tree mixed in with some ferns. These areas appeared to be damper than the other areas. The general area seemed to be very sandy soil and higher up the rich bush soil. Some plants of Pterostylis and Acianthus were growing in the sandy soil with little or no covering of leaves; others of course with a deep covering of leaves. A few plants of *Caladenia carnea* were found growing on rocks in moss.

I was told that a "Red Spider Orchid" has been seen in the area but I did not see any and neglected to enquire as to the exact location.

The Acianthus type seemed to be the most prominent species there with some plants still quite green and showing no signs of going into their dormant period.

No Thelymitras were located but one would assume that they must be there. During one trip I found three Calochilus (red bearded type), each find was a good distance apart and were only the single plant.

Area Two is a vast expanse of natural bushland with a good size creek at the bottom. A lot of work has been going on in the area (I think by the Water Board). One section is covered in ti-tree, which a few years ago sported the lovely blue flowers of *Thelymitra ixioides.* On this excursion four plants were found growing in rock-hard soil. No other species were discovered. It could be that we were too late and other types had died back or we did not look hard enough or in the right places. Only one epiphytic orchid was seen — *Cymbidium suave.* This area is worth exploring further next spring.

Area Three was in the Sutherland Shire — right on the edge of the National Park and alongside the Port Hacking River. Time is the enemy and only about one hour could be spared for a quick look. A well trodden path led into thick bushland which started at the edge of a popular picnic spot complete with sand and boat ramp. All within a small area four types of terrestrial orchids were found, all growing in very sandy soil and in full view of passers-by: a type of Pterostylis with the flower bud dying back; Calochilus in bud growing on top of a large rock covered in moss; four plants of *Caladenia carnea,* one pale pink and three white ones with very long flower stems obviously fighting the grass to reach the light; and either Acianthus or Corybas, a very small heart-shaped leaf, no sign of die-back or flower stems. Off to another area and quite by accident I found *Dendrobium linguiforme,* two small plants flowering profusely. Both plants were on exposed sandstone about 1.8 to 2.4 metres above the water level of the river. The only shade they might get would be from a small shrub growing above them.

In the same area are mangrove swamps with Casuarina trees in the higher areas. On a tree (the type not known to me) were two very small plants of *Dendrobium teretifolium* growing in moss that had formed on the tree trunk. Across from these small ones was a larger plant. The roots of this plant were all over the tree. No evidence of seed pods was found on the large plant but I assume that the small plants came from it.

In all my little trips around the Sydney Metropolitan area, I try to take the time to find some evidence of plants in the immediate area, make notes and comments for future reference for possible revisits at a more opportune time. These trips and notes that are taken can only benefit the taker and explorer in their efforts to cultivate and preserve our native orchids.

81 Darvall Road
West Ryde, N.S.W. 2114

October, 1979

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Miscellaneous Notes on New Guinea Orchids, No. 1

by T.M. Reeve

Calanthe vestita Lindl.

This well-known orchid of cultivation has now been recorded from Papua New Guinea. It was collected in flower in July, 1978 a few miles south-east of Lake Kopiago in the Southern Highlands Province (Latitude 5° 20′ S; Longitude 142° 30′ E), at an altitude of 1350 metres above sea-level. As far as can be ascertained from the literature, this species has not previously been recorded from New Guinea.

There was only a single plant growing about 5 metres up on the leaning trunk of an old, dead tree. There was quite a thick layer of decaying organic matter on the tree so the plant could be described as semi-terrestrial. Maybe the elevated position provided the necessary dry conditions to stimulate flowering in a climate which is fairly wet (approx. 2500mm per annum), and which has an unreliable "dry" season from June to September. In 1978, June and July were particularly dry months with rainfall recordings at Laiagam well below average.

The flowers are a pure white with a golden-yellow callus on the labellum. Preserved flowers, in 70% alcohol, have been lodged with Lae and Kew herbaria. (T.M. Reeve No. 323)

Dendrobium convolutum Rolfe

A single specimen of this species has been located in Lae herbarium and the details are as follows: —
N6F 42248 (J. Vandenberg and E. Mann) 6/69 Bagabag Island, Madang District (4° 50′ S, 146° 15′ E) 800 ft. above sea-level. Field Notes: "Leaves dull dark green, paler below. Flowers yellowish-green, labellum dark purple, side-lobes green with seven deep purple stripes".

There was also spirit material, and it is certainly a distinct species, quite different from *D. bifalce* Lindl. (Syn. *D. chloropterum* Reichb.f. et S. Moore). The labellum has large side-lobes (in comparison with the small narrow ones of *D. bifalce*), and a large rotund to reniform midlobe (nearly oblong in *D. bifalce*). There are two large rounded calli between the lateral lobes. Further measurements of the specimen were as follows: Pseudobulbs 12—15 x 0.4—0.6cm; Leaves ca. 13 x 2.6cm.

Dendrobium cruttwellii T.M. Reeve nom. nov.

— *Sayeria paradoxa* Kraenzl. in Osterr. Bot. Żeitschr. 44. 298-300 (1894)
— *Dendrobium sayeria* Schltr. in Fedde Rep. Beih. 1. 483 (1912), non *D. sayeri* Schltr. 1907.

This orchid, one of the smaller members of the section *Latouria,* has an interesting nomenclatural history. The type plant was collected on Mt. Obree, Central Province, Papua between 6,000 and 8,000 feet by W.A. Sayer in 1887. F. Kraenzlin, a German botanist, was quite puzzled by an abnormality occurring at the top of the stem between the leaves, and so created a new genus *(Sayeria)* with the species epithet *"paradoxa"*! In 1912, Schlechter rightly observed that this orchid was a *Dendrobium* belonging to the section *Latouria.* As the name *D. paradoxum* had been used before by Teysmann and Binnendijk for a species from Java, Schlechter renamed this orchid *D. sayeria.* However, Schlechter had previously used the name *D. sayeri* in 1907 for another N.G. species which was later transferred to the genus *Cadetia.* The two names being almost identical necessitates a new name for this species.

The new name now proposed is in honour of the Rev. N.E.G. Cruttwell, who has long been a student of the orchids of New Guinea. His collections in Eastern Papua (from 1946 to 1976), as well as watercolour illustrations (including an early drawing of this species) and photographs, provide valuable information on the orchids of that region.

D. cruttwellii has recently been added to the living collection at Laiagam and it is hoped to provide fuller notes and an illustration for the readers of *The Orchadian* at a later date.

Dendrobium engae T.M. Reeve

A careful search at Lae herbarium has located the early collections of this species. All the following are single collections (unicates) with no duplicates distributed overseas.

NGF 11792 (Dr Pike for A. Millar)	Jan. 1960 Wabag
NGF 11829 (Dr K. Pike for J.S. Womersley)	Jan. 1960 Wabag
NGF 23831 (A.N. Millar ex Flenley)	Jan. 1965 Wabag
NGF 23853 (A.N. Millar)	Feb. 1965 Nondugl W.H.P. 8000′
R.L. Hide 428	Jan. 1973 Koge, Sinasina Dist. Chimbu Province.

The notes with the original description in *The Orchadian* (December, 1979) Vol. 6, No. 6, page 125, paragraph 2 should be corrected to read as follows: ". . . plants were first sent to the Division of Botany, Department of Forests, Lae, in 1960" (not "in the mid 1960's"). It is also interesting to note that nearly all the above collections were made in January which seems to be the peak flowering month for this species. It is certainly so this year (1980), as these comments are being written.

Paphiopedilum praestans (Reichb.f.) Pfitz.

Another interesting orchid, also recorded from near Lake Kopiago, Southern Highlands Province, is *Paphiopedilum praestans.* Only a small colony was discovered and the plants were growing in a fairly exposed position, 1800 metres above sea-level, on loose limestone rubble both lithophytically and terrestrially. The plants were in full flower in July, 1978 enabling a set of herbarium specimens to be prepared (T.M. Reeve No. 78 in LAE, UPNG, K, L, CBG).

Dr G. Schoser of Palmengarten, Frankfurt, identified the plants as *Paphiopedilum wilhelminiae* L.O. Williams. The type plants of *P. wilhelminiae* were collected on the Third Richard Archbold expedition by L.J. Brass in December, 1938 at 1700 metres above sea-level in the grasslands of the Baliem Valley, West New Guinea, and the species was named in honour of Wilhelmina, Queen of the Netherlands. Recently, in 1977, this species was reduced to a sub-species of *P. praestans* by M.W. Wood in an illustrated article in Curtis's Botanical Magazine. My own opinion is that this orchid is just a highland form of *P. praestans,* and probably not worthy of the status of a distinct sub-species.

Brief Description:

Plants growing as terrestrial / lithophyte in clumps up to 30cm diameter. *Leaves* erect to spreading, oblong, thick, dark green on top, lighter underneath, 15—30 x 2.2—4.0cm. *Inflorescences* with 1 to 3 flowers per scape; peduncle hairy, 20—30cm long; rhachis 10—20cm. *Flowers* large, approx. 12cm wide. Dorsal sepal and synsepalum whitish with dark purple-maroon stripes; Petals with some purple markings and some hairs at the base; Labellum greenish-yellow with purple markings. Other details of the structure of the flowers can be seen in the accompanying illustration.

REFERENCES

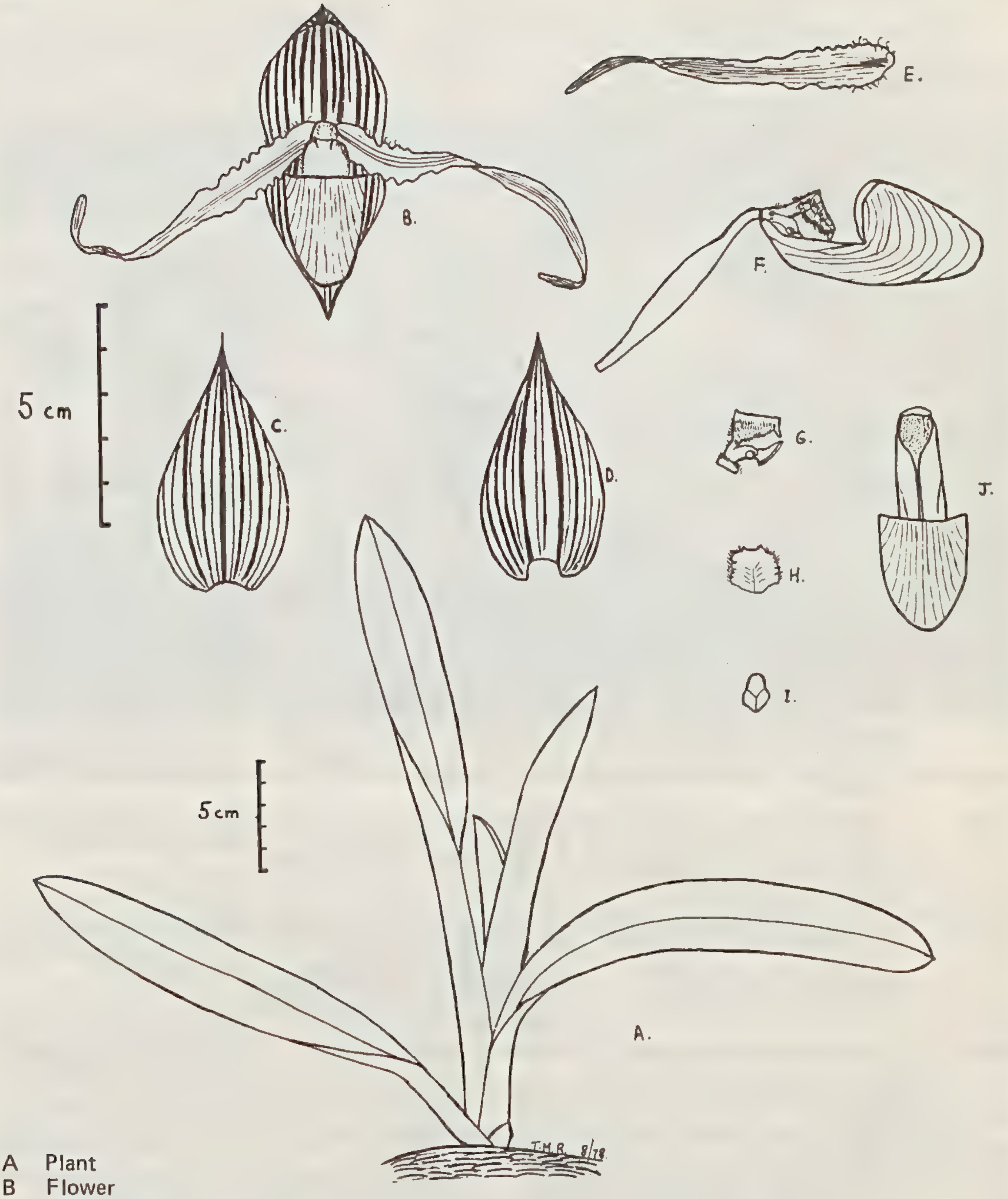
Williams, L.O. Am. Orch. Soc. Bull. 10.373-375: t 12 (1942)
Wood, M.W. in Curtis's Bot. Mag. CLXXXI (Pt IV): t 743 (1977)

ACKNOWLEDGEMENT

I wish to thank Mr J.J. Betts for checking one of the references.

Laiagam, Enga Province
PAPUA NEW GUINEA

January, 1980



A	Plant
B	Flower
C	Dorsal sepal
D	Synsepalum
E	Petal
F	Pedicel / Ovary / Column / Labellum
G	Column
H	Staminode
I	Stigmata

PNGH 700 *Paphiopedilum praestans* (Reichb.f.) Pfitz 1699

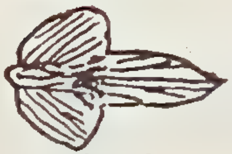
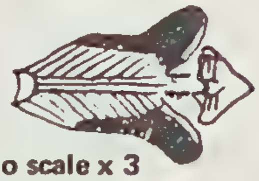
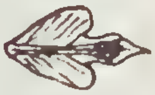
Drawing: T.M. Reeve (5/8/78

Dendrobium Judy Leroy as a Natural Hybrid ?
A PUTATIVE HYBRID FROM NORTHERN TERRITORY

by J.T. Simmons

During a visit to Darwin early in 1979 and in the course of discussing Northern Territory Orchids with Clyde Dunlop — Curator of the N.T. Herbarium — casual mention was made of a possible new Dendrobium species. The plant had been collected by Frank Woerle, a Ranger stationed at the Murgenella Forestry Station on the remote Cobourg Peninsula, N.T. and was described as a 'pink' Ceratobium type Dendrobium. Receiving a report that the plant was in flower in August it was arranged to send Len Henderson, a Field Officer of the Land Conservation Unit of the Territory Parks and Wildlife Commission, to examine and identify the species. Len flew to Murgenella on 10th August and as well as photographing the plant and flowers, attempted to pollinate it under adverse weather conditions. Unfortunately, the attempt to pollinate it appears to have failed. The specimen appears to be a putative hybrid with *Dendrobium canaliculatum* R.Br. X *D. dicuphum* F.Muell. as the parents. The flower form is very similar to the man-made hybrid D. 'Judy Leroy' with the dominance of *D. canaliculatum* very apparent.

A description of the flowers and a comparison with *D. canaliculatum* and *D. dicuphum* as recorded in the Field Report, written by Len Henderson, is quoted hereunder: —

	Ref: Australian Indignous Orchids A.W. Dockrill *D. dicuphum*	Ref: Australian Indigenous Orchids A.W. Dockrill *D. canaliculatum*	Murganella *Dendrobium canaliculatum x D. dicuphum* natural hybrid; R.L. Henderson
Stems:	5—50 x 1.2—2.5cm	are massed closely together	massed closely together
Raceme:	2—20 flowers	many flowers	4—21 flowers
Labellum when flattened:	 to scale x 2	 to scale x 3	 actual size — very nearly
Petals:	not twisted	slightly twisted	not twisted
Sepals:	not twisted	slightly twisted	not twisted
Colour:	Wholly white, white or very pale green outside and cream inside with deep maroon markings on the base and lateral lobes of the labellum or, sometimes, the whole flower pale pink.	White or pale green near the base with the remainder pale yellow and the labellum with varying amounts of rich mauve.	Mauve inside the base and on lateral lobes and lip of the labellum. The petals and sepals white at the base and mauve for more than half their distal ends.
Dorsal sepal:	12—20 x 4—7mm, oblong or narrow-ovate, shortly acute. Free portion beyond the mentum of the lateral sepals subsimilar to the dorsal one but sometimes slightly broader.	Dorsal sepal about 9—15 x 3—4mm oblong, acute. Free portion of the lateral sepals beyond the mentum 7—10 x 3—4mm, oblong acute.	Dorsal sepal 12 x 4mm oblong or narrow-ovate, acuminate. Free portion beyond the mentum of the lateral sepals slightly falcate.
Petals:	Petals about the same length as the dorsal sepal but 10—15mm broad obovate or broad-spathulate usually not sharply constricted into a claw at the base.	Petals erect a few mm longer than dorsal sepal, ± linear spathulate, the apex usually rounded apiculate.	Petals erect, linear spathulate apex rounded apiculate.
Leaves:	On more than half of stem. 2—10, 3—18 x 0.6—3.0cm, narrow triangular or narrow-ovate, usually acuminate often decurved.	Leaves at top of stem. 2—6, 5—20 x 0.6—1-2 x 0.3 — 0.6cm linear or slightly tapered from the base to the apex, acute or acuminate, semi-cylindrical but longitudinally grooved on the upper side.	Leaves at top of stem. 1—4, 11 x 140mm, erect narrow-ovate, acuminate.
Habitat:	Preference for paperbark trees.	Preference for paperbark trees.	Collected from branch of paperbark tree by F. Woerle.

Visit to Murganella Forestry Station on 10th August, 1979 for the purpose of pollinating native orchid flowers of the Dendrobium species: —

Plant in full bloom has 18 stems, eleven of which bearing a raceme with from 4 to 21 flowers, some unopened. A dozen or more dead stems make up the full tuft.

STEMS: 100—170mm long, 9mm to 12mm thick, thickest in the middle and bear from 1 to 4 leaves near the top.
FLOWERS: 32mm diameter, widely spreading, mauve inside base and on lateral lobes and lip of labellum.
The sepals and petals white at the base and mauve for more than half their distal ends.
Dorsal sepal 12 x 4mm oblong or narrow-ovate, acuminate.
Free portion beyond the mentum of the lateral sepals slightly falcate.
Petals erect, linear spathulate, apex usually rounded apiculate.

Pollinating of flowers difficult due to strong wind blowing away extracted pollen before it could be placed in stigmatic cavity. Eventually eight (8) flowers successfully pollinated by myself. Frank Woerle attempted a few flowers also, to learn the method. Spent about 45 minutes doing this and writing down description and taking photographs of plant whose flowers are indeed exceptional in symmetrical distribution of coloured and white parts. I named it *Dendrobium canaliculatum* for its resemblance to the type variety seen in the Northern Territory.

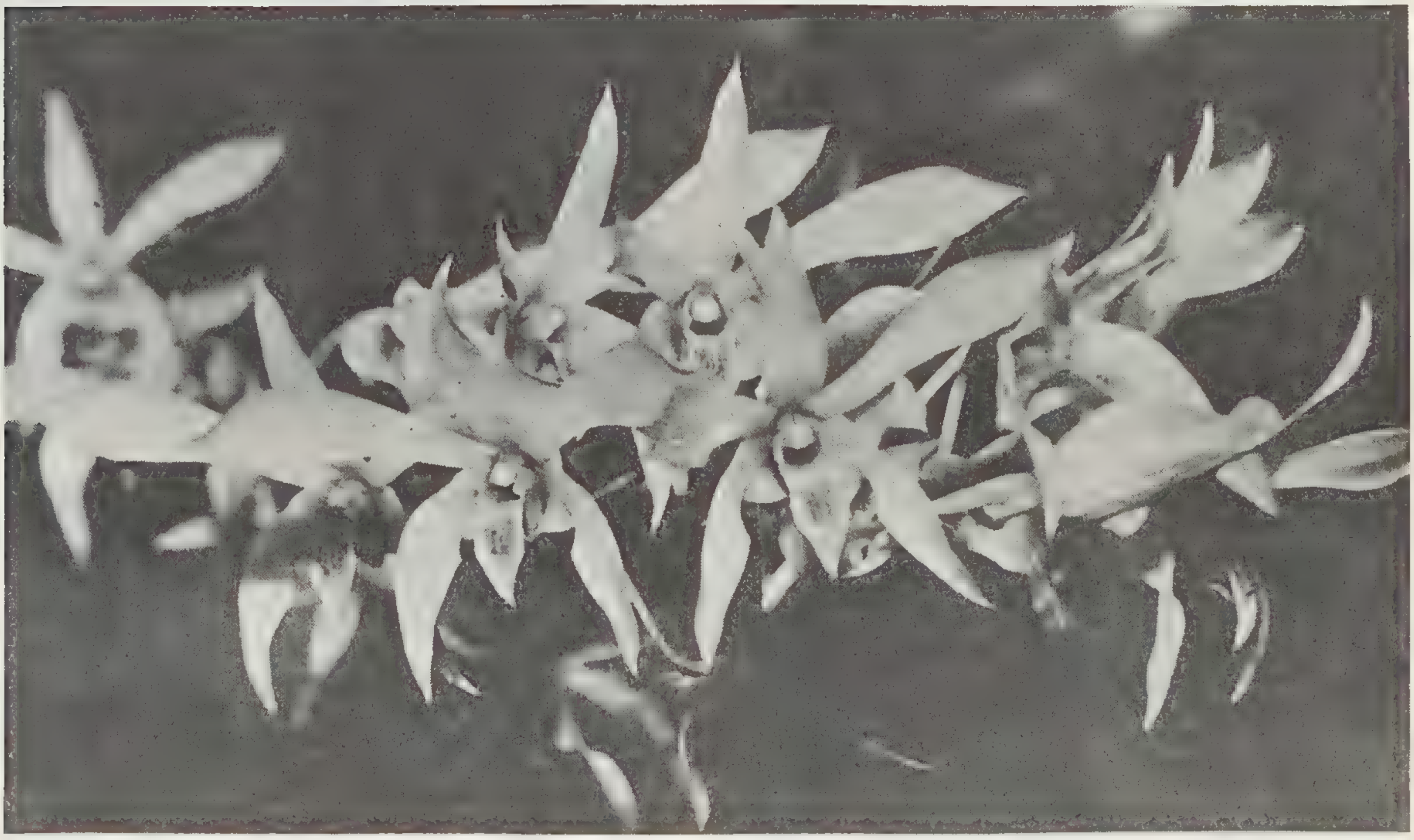
Two photographs taken, one in westerly and another in easterly direction approximately. Its host is a barkless log of wood which is one of four posts supporting the platform on which a water tank rests.

R.L. HENDERSON — 13/8/79

While a single occurrence is NOT the basis for recording a new natural hybrid, some herbarium material, a report and photographs have been forwarded to the Royal Botanic Garden, Sydney, for future reference.

The co-operation of Clyde Dunlop and Len Henderson of Darwin and the material and information supplied are gratefully acknowledged.

4 Gothic Avenue
STONYFELL, S.A. 5066



Putative Hybrid (N.T.) Photo: J. Simmons

Some thoughts on *Dendrobium gracilicaule* F. Muell.

by Ted Gregory

Of all the orchids that inhabit the bush in my part of the world, I think *Dendrobium gracilicaule* is the most overlooked. I do not know what causes this attitude. Perhaps it may be the rather insignificant size of the flowers in comparison with some of its more spectacular neighbours or just the fact that it is so prevalent in most of the areas where it grows. However, I hope this note will raise this little gem and put it in a more deserving spot in the estimation and collections of all orchid growers.

I must admit that *D. gracilicaule* has always had a special place in my heart as it is one of the first orchids that I became associated with as a child, and my earliest efforts at culture revolved around tying small plants on to the loquat trees that grew around the house where my parents lived and worked during the thirties. Looking back now, I guess one of the main reasons would have been the fact that these little plants would have been just the right size for a little boy to pick up behind the timber-getters. Another memory is how I hated to see these beautiful little things left on the ground to die of starvation or be burnt by the clearing fire that would surely follow. I also remember as I grew bigger how I would drag home those beautiful rock lilies, as I knew them then, and how a wonderful Mum and Dad would take time off from their work and help me to strap these monsters on to those long-suffering loquat trees.

How the years fly by: my loquat trees have long since disappeared, along with the old slab house they surrounded; and alas, almost all the glorious bush of my childhood is just a memory too.

As you can see by the previous paragraph, I am a bit of a romantic, and am easily side-tracked; so I had better get back on course before the editor declares me *persona non grata.*

D. gracilicaule has one of the widest ranges of any of the Australian orchids with which I am familiar as far as altitude is concerned, being common from almost sea-level, and ranging through to the highest scrubs that I am familiar with. This would cover a range of at least four thousand feet and shows that this is an extremely adaptable orchid, altitude-wise. The same applies to its choice of habitat and hosts, as it grows happily in the light coastal scrubs, through the dense rainforests to the light forests of the highlands and at times it will even venture into the open forest where King Eucalypt reigns unchallenged. However, *D. gracilicaule* is happiest in the scrubs at altitudes of five hundred to two thousand feet. Those myrtle scrubs that I have often talked of are a favourite haunt of this orchid. I have often seen myrtles with a hundred or more *D. gracilicaule* and *D. speciosum* growing happily together on all the available branch space. These *D. gracili-*

caule plants would range from tiny seedlings of a couple of canes to plants of up to three hundred canes.

The *D. gracilicaule* of the eastern Australian coastal strip has one outstanding feature, and that is the slenderness of the canes. These canes can be any length from around ten to twelve inches, to well over two feet long on some specimens, and no matter what the length of cane, they will be seldom more than a quarter of an inch thick, except at the end of a good wet season when they will fatten up considerably. The leaves are carried at the end of each cane and normally number five or six, although nine are not uncommon in some areas. These leaves are usually three to four inches long, fairly narrow, and not very fleshy.

The flowers are carried on fairly short racemes and usually number from ten to twelve; although spikes of twenty or more are not uncommon, and are generally under half an inch in diameter. Most remain fairly hooded, though some will open quite flatly after a couple of days. The usual colour is a greenish-yellow, clear on the inside and heavily dappled with reddish brown on the outside. As with any species, the colour range within certain limits is very variable. These colours will range from just off white to a quite deep orange and the dappling will vary just as much too. Some plants have almost no dappling at all; in fact some could almost be classed as clear colours. No matter what the combination of the colours, a large well-grown plant is surely a joy to behold. A trait that adds to this plant's charm is the fact that it will flower off any node on the upper half of the canes over a period of years.

Its natural hybrid *D. X gracillimum (gracilicaule x speciosum)* has also inherited this ability to flower over a great portion of the length of the cane, and to have the cane flower over a period of years.

The roots of *D. gracilicaule* are quite fine in comparison to most Australian dendrobiums and as a personal observation I find it hard to grow these finer rooted types to perfection in pots. They will grow reasonably well in pots, but there is a great deal of difference between reasonable growth and perfection, and I think every dedicated grower likes to aim for perfection. I have found this orchid really thrives on a slab of tree-fern or ti-tree, or even a piece of old hardwood. Any plant obtained should be tidied up by trimming off all damaged and old roots, then fungicided, given a growth starter and then strapped on to one of the above mentioned hosts, and then with any luck the plant will grow on readily. And by mounting on something of this nature one does away with the old problem of repotting.

Dendrobium gracilicaule Photo: Garry Wells

Dendrobium gracilicaule Photo: Garry Wells

Reverting to the remark on the thin rooted types of Australian dendrobiums I find that *D. tetragonum* and *D. aemulum* are others that come to mind that I can grow much better by the above method. This also makes more bench space available for the use of other plants.

I guess most of you are also familiar with the variety of *D. gracilicaule* named variety *howeanum* that grows through some parts of the Pacific Ocean. However, I do not feel qualified to comment on this orchid as I have not had the pleasure of seeing it growing in its natural habitat. I have been growing plants of it for a long time, but that is not the same as being familiar with the plant *in situ*.

Since my last article in *The Orchadian* my family and I have moved to Mount Tamborine in Queensland to make our new home. We are now living at an altitude of roughly eighteen hundred feet, where all our beloved orchids seem to be settling down well, but I guess it will be some years before we know exactly how everything will go here. Until I mention otherwise, any notes will be written for the same part of the world as before, as most of my orchid lore has been gathered in the Gloucester-Manning-Hastings area of New South Wales.

I must apologise to all "Orchadians" for the lack of cultural notes in the last few issues from me. With all the hustle and bustle of moving house and orchids I became snowed under with correspondence and just could not cope for a while. However, I am starting to catch up again as things return to somewhere near normal. I find it hard to write a note on culture alone without becoming repetitive, as all one has to do is look back at a year's copies of *The Orchadian* for the general gist of basic culture. And with the editor in the happy position of having a surplus of material I thought I will just include items that may be of general interest at the foot of any articles in future.

As we move into another Autumn, a lot of us can look back on one of the hottest and driest summers for many seasons; which has been absolutely ideal for the multiplication of cockroaches and red spider mites and steps must be taken to wipe these pests out so they do not have a head start on you and your plants in the coming spring. A night inspection is needed to spot cockroaches, but those silvery traces on the underside of orchid leaves betray red spider at all times. Use the appropriate sprays or dusts to fix these pests, and be careful how you use these things or you may fix yourself at the same time.

Merrellen, Lot 1
Oxenford Road
30 November, 1979 **MT. TAMBORINE, Qld. 4272**

LETTERS TO THE EDITOR

From Our Man in Penang

Dear Sir,

Hope everything is well and your orchids are growing and flowering well. Finally received Vol. 6 No's 5 & 6. It is excellent work. The contributors are certainly some of the best in the world. All you need now is a letter from Garay on *Sarcochilus brevirhachis* and you would have the world's best all in the one journal. I bet if Linneus was around he'd even do an article for you.

I still support the idea of dropping from *The Orchadian* cover the 'December', 'June', etc. above the price and instead call the issue 'Summer 1979', etc. It seems more natural for a journal on nature.

For the Spring show could I also suggest a photographic competition of slides and a viewer set-up and a tape recording, if available, to show orchids that can't be displayed. A photographic competition would also help to involve W.A., S.A., etc. and help display their terrestrials.

That's all I can think of. I'm looking forward to the Autumn issue of the Orchadian.

All the best,
PETER VAUGHAN
4 Jalan Bunga Pudak
Hillside, Tanjong Bungah
PENANG, MALAYSIA

Date:
Sometime in January, 1980

On Judges & Gaols

Dear Sir,

Pleased though I am to see "terrestrials" prominent in the show ring I do feel, however, that they have unfair advantages over epiphytes. Trying to be brief and to encourage the thoughts of potential plant show participants, I have selected areas where I feel terrestrials have an unfair advantage over epiphytes: —

- It is very easy to remove poor specimens from a pot leaving no sign of their past presence. I should know as I did it to the plant that won Champion Species at the A.N.O.S. second annual Spring show. A few plants were lost, but an award won.
- Last year's growth, being deciduous, is lost and so a concerted effort for one year gives a potential winner. At present a considerable advantage over epiphytes.
- Signs of recent collection are not present, especially if the plants are potted up each year.
- The epiphyte is at a disadvantage as it shows its roots Just one snail can destroy a lot of growing tips giving an unsightly and frowned-upon appearance.
- The judging standards take only the best clone if more than one is present, i.e. a terrestrial is judged on the best individual flower. Hardly a fair test if there are 20 — 30 flowers in each pot. Why not consider the best 30% of the pot for individual flower characteristics?
- The size of the terrestrial plant and flower varies with the size of the initial tuber. Les Nesbitt places the largest tubers in the centre of the pot and smaller tubers around the edge. This gives a very good effect, showing care, forethought and tidiness. Could a clause be added to the judging standards to encourage this? Also the small flowers should not detract from the value of the pot.
- Are terrestrials really harder to grow compared to a show quality epiphyte? *Pterostylis nutans, P. curta* and many others are quite easy with a bit of experience, especially with the flood of culture notes now available in *The Orchadian.* Should the person living in the right area, making it impossible **not** to grow *P. grandiflora,* be given a big advantage over others? Judges should weigh very carefully the emphasis they give this aspect.
- The judging standards should allow for the fact that a pot of terrestrials has natural variation and so they won't all be at the same stage of flowering. Don't penalise the pot that has buds withered flowers (or better still developing pods) or even rosettes with no intention of flowering. I'm not saying to give prizes to pots of seedpods but to just show more tolerance.
- What is wrong with yellow, sunburnt leaves or stunted epiphytes? I see them all the time in the bush. I would prefer to see a sunburnt leaf to seeing the stump where it was cut off (a common practice). It may also teach viewers that it is natural, so they won't worry if their plants are the same.
- Eaten leaves! A big problem. Do the judges want plants drenched in DDT & fungicide so they are dangerous to touch? (An advantage only while the show is on, so don't be short-sighted.) Or do we try biological control, i.e. let the wall lizards, frogs and shoe kill off the predators. I know which I prefer. Unfortunately, grasshoppers get to odd leaves before my foot gets to them. At present I am at a disadvantage to the chemical growers. But after their chemicals have killed them off I will be the only one left to show plants and must win. I'll wait.

To sum up, if we love our plants we should stop poisoning them, let them roam free in our gardens (not gaoled in our often locked orchid houses) and let their pollinators and birds get to them so we won't have frustrated plants. On the showbench the plants should be happy and contented, not perfect. If our judges live up to the faith we have in them, they will know a happy plant from 40 yards.

Lastly I hope this doesn't tip the barrel and force a new judging course where the judges have to learn to talk to plants. Just new judging standards will do.

PETER VAUGHAN
4 Jalan Bunga Pudak
Hillside, Tanjong Bungah
PENANG, MALAYSIA

Date:
Mid-January, 1980

Wasps and *Leporella fimbriata*

Dear Sir,

The article on 'Pseudocopulation in Australian Terrestrial Orchids' by Warren Stoutamire (*The Orchadian* Dec. 1979) brought to mind the day, a few years ago, when my husband and I found wasps on flowers of *Leporella fimbriata.* Apparently wasps are active when the temperature is 23°C or more and, on this particular day, in late autumn, a sudden change had reduced the warmth and the wasp was lying, rather torpid, on the wide labellum of the *Leporella fimbriata,* the orchid pollinia on its back. The wasp was easily caught for later identification and this was valuable in confirming our second find a few miles further on. In another colony of the Fringed Hare-orchid *(Leporella fimbriata)* we noticed a similar-looking wasp, on the ground just below a flower, inactive from the cold but also with pollinia on its back. Later it was identified as a 'Hymenopteran, very close to the Ichneumonaideae' (David Jones in a personal letter). We have had no opportunity to pursue the matter further but, with the rising interest in orchid pollination generally, someone may wish to continue investigations. *Leporella fimbriata* is widespread in the south and occurs in S.A. and W.A. as well as Victoria — in warmer, waspier areas than Portland! However, there was another waspy occasion here one Christmas, when an Ichneumon wasp was trying frantically to get through the wire-screen of our sunroom to a pot of *Cryptostylis erecta* inside. This beautiful orchid has been producing flower spikes regularly for over ten years and attracting attention from viewers — but we didn't expect it to exert such strong attraction through windows!

Peter Vaughan's article on *Pterostylis barbata* Lindl. and *P. plumosa* Cady. paid deference to their 'magnificence' — an apt description. In early spring we saw quite large colonies of the distinctive leafy rosettes of *Pterostylis plumosa.* Returning later to admire the flowers, we found, instead of beautiful Greenhoods, empty spaces and the odd rosette or small flower tucked under a bush. Rabbits had joined the predators of the species — not for the tubers, but the leaves.

D.T. WOOLCOCK
36 Townsend Street
PORTLAND, Vic. 3305

10th January, 1980

CALADENIA HASTATA W.H. Nicholls* and OTHER ORCHID SPECIES of SOUTH PORTLAND, VICTORIA

by D.T. Woolcock

After "disappearing" for many years from the Portland district, *Caladenia hastata* was rediscovered in coastal heathland south of Portland a few years ago, following a wild-fire through the coastal scrub. Apparently abundant in earlier days, it lost habitat through clearing for pasture and became, as far as one could judge, an extinct species – along with some relations, *C. patersonii var. arenaria,* and in this area *C. leptochila* (listed once for Mt. Richmond) and *C. pallida.* Unfortunately, it has chosen to re-appear in a wet coastal heathland that is being proposed for an Alcoa Aluminium Smelter and, though efforts to save the species are being made by local naturalists – and by Alcoa in having seed grown under laboratory conditions with a view to replanting in the Portland district, it will face difficult conditions of survival, both from clearing for factory siting and later from emissions.

Known locally as Mellblom's Spider Orchid, *Caladenia hastata* has a very attractive flower with heavily clubbed sepals and petals and, immediately following the fire mentioned above, appeared in quite good numbers in scattered patches of the heathland. As the ground cover has thickened, it has continued to grow in the more open sandy heath and seems to be holding its own – up-to-date! From the start this species appears to have had a somewhat chequered career and J.H. Willis (Handbook of Plants in Victoria, Vol. I, 2nd Ed.) has some interesting comments to make about it. "As recognised in this key, it *(C. reticulata)* covers a polymorphic assemblage from which two variants have been accorded specific rank within recent years, viz. *C. fitzgeraldii* . . . ; also *C. hastata* (W.H. Nicholls ut *C. patersonii var.*) H.M.R. Rupp in Vict. Nat. 58:198 (1942) – a population in the Portland district having longer (10 – 20 mm) blackish clubs on the sepals, sometimes with clavate petals also, and a usually paler labellum with marginal calli extending nearer to the base than in the typical South Australian *C. reticulata* . . . . . Puzzling intermediate states exist between the extremes assumed by this species, which is no more variable than either *C. patersonii* or *C. carnea,* and any attempt to give names to the various local forms or mutations within the complex is deemed inadvisable at present." So *C. hastata,* having survived classification as a variety of both *C. patersonii* and *C. reticulata,* achieved specific rank and disappeared from view for a number of years. Now it is an endemic species** in a restricted area and is once again under threat of losing its habitat. The Alcoa scheme of having seed grown by professionals in the Waite Institute in Adelaide, then re-introduced to habitats in the Portland district similar to those of its past and present growth, is in itself an interesting experiment which could be watched and judged over the next few years. Success in this project could, perhaps, offer a solution for the preservation of other threatened species ?

Caladenia hastata grows 20 – 26 cm high and has a hairy leaf and stem, the leaf being linear-lanceolate, 8 – 10 cm long. The flower is white or creamy and both sepals and petals have large dark clavate tips. Perianth segments are spreading, the dorsal sepal erect. The labellum is cream-coloured, with toothed margins and usually 6 rows of calli. The teeth continue along the full length of the margins and are coloured maroon and yellow, the same colours occurring in the linear golf-stick form of the calli, which becomes smaller and creamier at the tip. The column is incurved, winged widely above but narrowing in the lower part, wings being green and yellow, the column with a few thin longitudinal red lines. It would appear to have features in common with *C. patersonii* var. *suaveolens,* particularly in the shape and colouring of the labellum, the toothed edges and calli, but the clubbed sepals and petals bring it closer to the *C. reticulata* complex. In its own right it is a beautiful species and deserves its rank as such.

In addition to *C. hastata* the coastal heathland of South Portland supports quite a range of orchid species, which are mostly well distributed throughout the district, in National Parks, Reserves and State Forests. Following the fire a few years ago, orchids grew in profusion and a large number of species were recorded in the seasons following. Here is a list: –

Pterostylis alata, P. vittata, P. parviflora, P. plumosa, P. nutans, P. longifolia.
Leporella fimbriata, Lyperanthus nigricans, Orthoceras strictum, Caladenia deformis, C. latifolia, C. dilatata, C. menziesii, C. carnea, C. patersonii, C. hastata.
Prasophyllum despectans, P. elatum, P. patens, P. beaugleholei.
Diuris longifolia, Acianthus exsertus, A. reniformis. Glossodia major, Microtis unifolia, M. parviflora, Eriochilus cucullatus.
Thelymitra antennifera, T. holmesii, T. longifolia, T. rubra, T. aristata, T. ixioides, T. pauciflora

and a few comments from Alcoa's "Environment Effects Statement": –

"*Caladenia patersonii* (Common Spider-orchid), now rare in Victoria as a result of destruction of its habitat, though found in all other states.

Broad-lip Leek-orchid *Prasophyllum patens,* rarely collected in Victoria, but found in all states except Western Australia.

Prasophyllum beaugleholei (Beauglehole's Midget-orchid), a disjunct Victorian distribution in far eastern Victoria (Ensay to Bonang); previously found in only 3 west Victorian localities, but also found in Tasmania and New South Wales. The present record constitutes the fourth western Victorian record."

10 January, 1980

36 Townsend Street
PORTLAND, Vic. 3305

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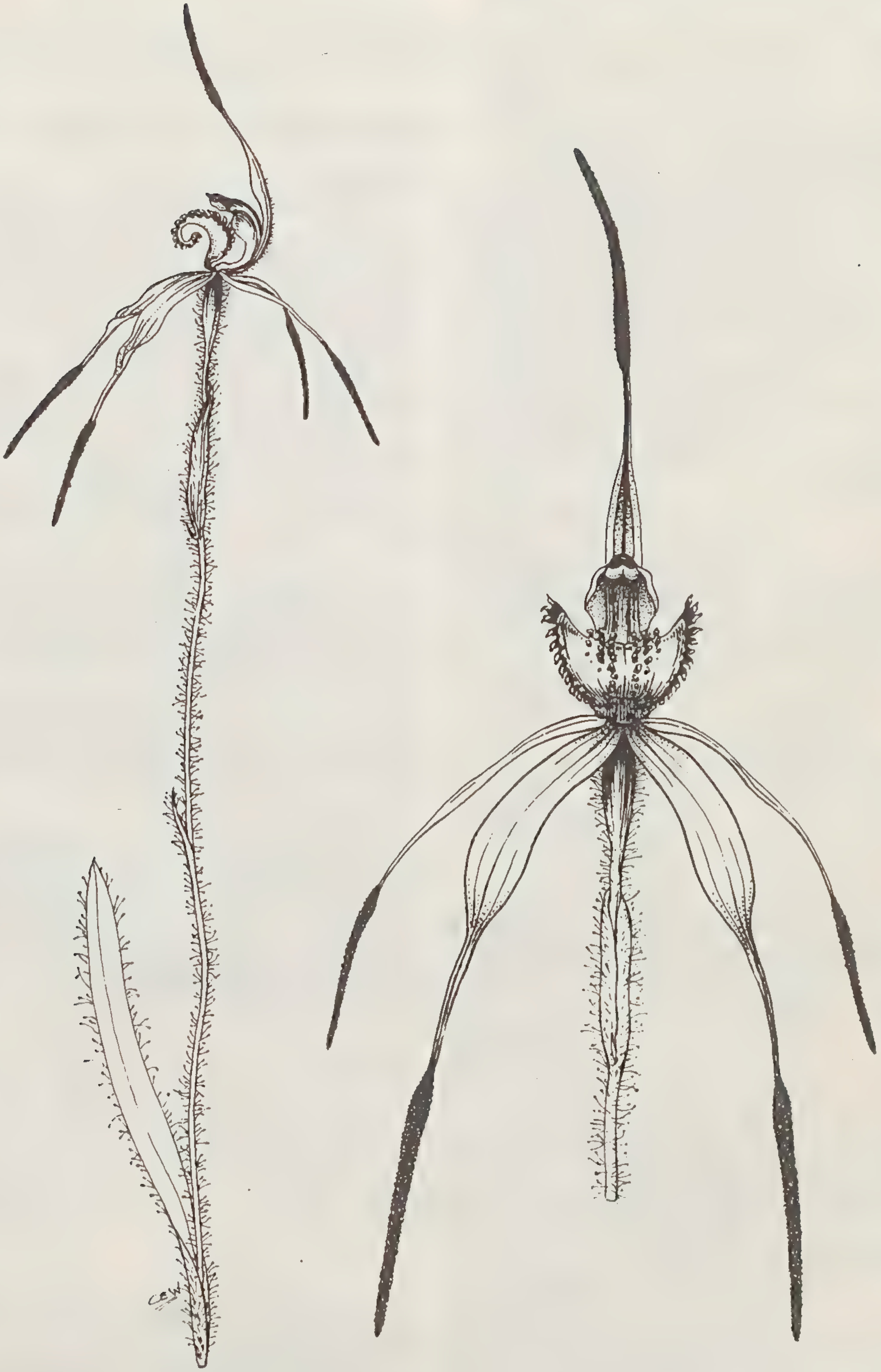
* Mr D.F. Blaxell comments: "*Caladenia hastata* W.H. Nicholls is currently considered to be a local variant of the widespread and polymorphic species *C. reticulata* R.D. Fitzg. In fact the quote from Willis *(Plants of Victoria)* says just that."

** Mr D.F. Blaxell comments: "I do not agree that this reflects the present view of this taxon. In fact quite the reverse applies – it is no more than a local form of a widespread species (according to Willis) and should not be considered a rare and endangered endemic species in the Portland region. A rare and endangered local population of a form of *C. rediculata,* yes, but not a species."



Caladenia hastata
Plant natural size. Flower enlarged x 2.

Drawing: Collin Woolcock

THE FLORAL ANTHOCYANINS
with particular reference to *Thelymitra ixioides*

by G.C. Morrison

Abstract*: The principal purpose of this paper is to describe the tests and test results pertinent to the floral colouring in *Thelymitra ixioides*. This was found to be Raphanusin C. However, for these results to be meaningful to the orchid grower, a brief review is given on the nature and significance of anthocyanin colouring matter in flowers with an explanation of colour change and absorption wavelengths.

Introduction: The colouring substances in flowers may be placed into two groups, viz: —

1) Those substances which are water soluble, and
2) those substances which are not water soluble.

These may occur separately or together in any flower but their location within the flower cells is dependent upon solubility. The first type contains the flavonoids, a collective name given to flavonols, flavones and some minor types such as the Chalcone pigments plus the anthocyanins. These latter produce the red, blue, purple, mauve and cerise petal colours and sometimes even orange. Being water soluble these substances are contained in the cell vacuole which is the non-living part of the cell, closed off from the living tissue by a membrane called the tonoplast. The second group consists of carotenes, giving orange and yellows and chlorophyll which gives the green colouring to petals. These are contained in small bodies (plastids) circulating in the living cytoplasm of the cell. This group is not the subject of this paper and will not be treated further here.

In New Guinea in 1908 at 7,000 feet Schlechter found and named *Dendrobium magnificum*. The flowers are orange-yellow with red spots which form a background for the olive-green labellum which is veined with red. This must be sufficient to whet the appreciation of all orchid growers but it also illustrates that several different substances may contribute to the colouring of the flower. The complexity of the genetic system to build the molecules of these substances and to arrange for their appearance in the correct places in every flower of the species is something to be marvelled at and is generally just too hard to comprehend.

The business of the taxonomist is to place plants in some sort of relationship one to the other. Ever since the time of John Lindley (1799—1865) taxonomists concerned with orchids have produced many and varied pigeonholes into which tribes, sub-tribes, genera and species have been fitted so producing schemes of classification, many of which have some merit but none of which satisfies other taxonomists.

The classification of a plant is largely based on a matter of personal choice, e.g. whether the number and texture of the pollinia is important or not. One has only to read the descriptions of several species of the one genus to realise that there is no clear and set method of describing a plant. The attributes of one species are sometimes scarcely mentioned in the description of another species. This makes comparison difficult. In an endeavour to make taxonomy of all types of organisms much more objective many taxonomists are turning to Numerical Methods of Taxonomy where many attributes (say 100 or so) are recorded and analysed by computer. This tends to emphasise similarities between species or genera which may not have hitherto been suspected. This procedure does require a lot of data and it is here that the chemistry of the plant can make some significant contributions. Examples are: the presence, absence and type of alkaloids produced; the anthocyanins and flavones/flavonols present; and no doubt in the future a protein analysis will also contribute significantly to the attributes used in the analysis.

However, before all of this is possible much work must be done to produce the chemical data and the work described herein is just one small contribution to the whole. Readers are referred to the papers by Lavarack (1971) and Lawler, Slaytor and Done (1971) listed in the References for further interesting discussion on this subject, particularly in relation to orchids. Other references are also mentioned under the next heading.

Historical:

A survey of the anthocyanins in Australian flora was carried out by Gascoigne, Ritchie and White (1948). The very long list of species covered (228) included 13 in Orchidaceae and *Thelymitra ixioides* was listed as containing a Cyanidin dimoniside. The method of analysis used depended largely on the partition of anthocyanins between immiscible solvents and the colours of the extracts. This method was not able to identify the sugar and the other components of the anthocyanin.

In 1944 the technique of paper chromatography was devised and used for protein analysis. It was not until 1948 that Bate-Smith introduced this method to anthocyanin analysis. Paper chromatography has been a valuable, simple and cheap analytical method widely used ever since but was not available to Gascoigne *et al.*

At a later date Harborne reviewed the work done on chromatographic identification of anthocyanin pigments (1958a) and also spectral methods of characterising anthocyanins (1958b).

Since then the pigmentation in the floral parts of many plants has been investigated with the notable exception of Bignoniaceae and Orchidaceae (Harborne 1967). Some work on species and hybrids of *Broughtonia, Brassavola* and *Cattleyopsis* was done by Arditti (1969) and by Arditti and Ernst (1971) in respect of anthocyanins as chemotaxonomic markers.

The anthocyanins of two Australian species of *Elythranthera* were investigated by George, Gonzales, Strauss and Arditti (1973) but other than this there does not appear to have been much work published on the anthocyanins in Australian Orchidaceae.

The Anthocyanins:

These are relatively stable substances generally composed of a coloured part (the chromophore) and one or two sugars. Sometimes an organic acid, such as ferulic acid, is added into the anthocyanin molecule. The structure of a simple anthocyanin is shown in Fig. 1. This is Pelargonidin 3-glucoside because glucose is attached to the number 3 position of the A ring of the Pelargonidin molecule. The sugar may also be attached to other positions, such as 5 and 7 (as numbered).

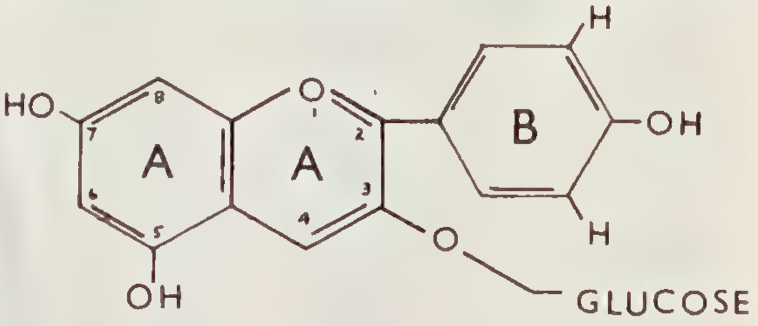


FIG I

Fig. 1: The formula for Pelargonidin 3-glucoside showing the positions on the molecule numbered by convention. The sugar Glucose is attached to an atom of oxygen (O) in place of Hydrogen.

If the sugar is removed from the molecule shown in Fig. 1 the resulting compound is the anthocyanidin (the chromophore) and this is very unstable, losing its colouring properties quite rapidly, necessitating quick and uninterrupted work for its analysis.

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* Key Words for indexing — *Thelymitra ixioides* — Anthocyanins — Raphanusin C.

Some 16 naturally occurring anthocyanidins are recognised, i.e. chromophores with no sugars attached. Six of these are common in a wide range of plants and have been named — Pelargonidin, Cyanidin, Delphinidin, Peonidin, Petunidin and Malvidin. Orchid growers may be disappointed that orchids do not get a mention here but, as explained previously, very little work has been done on the Orchidaceae in this respect. Most, but not all, of the variation between anthocyanidins takes place in the B ring of the molecule. The OH in Fig. 1 is called a hydroxyl group and one such group is shown attached to the B ring.

Colour is, of course, in the eye of the beholder and scientifically we speak of wavelengths of light rather than colour. This has been done in the following text so some clarification is appropriate.

Light having a wavelength of 700 nanometres (700 x 10^{-9}metres) appears to the eye as red. Light having a wavelength of 400 nanometres (nm) appears to the eye as violet. Between 400 and 700 nm is the visible spectrum with a centre point of 550 nm which appears as yellow-green. Just as chlorophyll absorbs both "red" and "blue" wavelengths and so appears to be green, the anthocyanins absorb light in the middle register of the spectrum and appear variously as reds and blues or variations thereof depending on actual wavelength of absorption, the pH and chelation.

Reverting once again to Fig. 1 if we now add another hydroxyl group to the B ring in place of a H (hydrogen) the colour becomes less red and more blue. The wavelength of maximum light absorption has been increased from 520 nm to 535 nm (in acidulated methanol). This substance is Cyanidin.

If another hydroxyl group is added to the B ring in place of the other hydrogen, the blue-ness increases. The wavelength of maximum light absorption has been increased to 545 nm. This substance is Delphinidin.

These are the three basic anthocyanidins, two of which in turn, may be increased in their red-ness (but not quite as red as Pelargonidin) by adding a methyl group (CH_3) in place of the H in one or two of the OH groups. The sugars may be attached in various positions around the A rings, as mentioned above and the point of attachment does have a slight effect on the colour exhibited by the molecule. The attachment of two sugars, similar or dissimilar, at different positions, e.g. the 3 and 5 positions usually causes the molecule of anthocyanin to fluoresce in ultra-violet light, a fact which can be significant when considering pollination by insects. The nature of the sugar has no effect on the colour. The most common sugar found is glucose but also galactose, arabionose, xylose and rhamnose are found frequently.

It is not unusual to have sugars attached to each other, i.e. in series and sometimes an additional molecule of an organic acid is attached to the sugars. These organic acids are very labile and easily detached during analysis and may be missed. The acids found are p-coumaric acid, ferulic acid and caffeic acid. Their purpose, if any at all, is not clear. They hang on to the anthocyanin molecule like an appendix. Perhaps they have no real purpose.

Finally increased blue-ness may be obtained by chelating the anthocyanin with iron or aluminium but just how this occurs and by which enzyme, is still something of a mystery. It is clear then, that the red/purple flower colouration depends on the ability of the genetic material to produce enzymes to attach OH or OCH_3 groups to the colourless precursor of the anthocyanidin, then to attach the selected type of sugar in the desired place on the molecule and finally to chelate (if possible) with iron or aluminium.

Methods:

The following explanation of methods is given solely to make the following results meaningful and do not in any way attempt to describe the full procedures used.

The anthocyanin is extracted from the flower by using methanol at room temperature. Many workers seem to use acidulated methanol but I have found this removes the organic acid group too readily. The extract is then purified. Two principal methods of analysis are used: —

1) Paper chromatography, wherein a very small quantity of the extract is placed on to a special type of paper. This is then suspended into a series of solvents (or mixtures of solvents) and the distance the spot of the substance (or substances) travels, as compared to the solvent front, is measured and multiplied by 100. This is commonly known as the R_f value. This is done for both the anthocyanin and the anthocyanidin.

2) The wavelength of maximum absorption of light of both the anthocyanin and anthocyanidin is measured and compared to the absorption maximum of authentic substances. The ratio (as a %) of absorption at 440 nanometres to that at the maximum absorption wavelength (in vicinity of 500 to 550 nm) is also used to assist in determining whether a sugar is attached to one or two positions on the A ring. A low percentage figure indicates two sugars attached separately rather than together at the same point.

Parts of the purified extract are then subject to two degradations —

a) Removal of the organic acid. This is done to check if it is present and to establish its identity.

b) Removal of the sugars and their analysis and the identification of the remaining chromophore. Both processes use chromatography.

Measurements are then made of the maximum absorption wavelength of both the anthocyanin and anthocyanidin plus the absorption ratio of the anthocyanin at 440 nm and max. absorption.

Test results:

The results of the tests conducted are set out below to justify the final identification of the flower colouring in *Thelymitra ixioides.*

1. The anthocyanidin was firstly separated from any attached organic acid and sugars. This is now called the aglycone.

a) Absorption maximum.
sample aglycone = 535 nm
Cyanidin (published) = 535 nm

b) Chromatography on Whatman 3MM paper.

In two solvents.

	Forestal	*Formic*	(refer appendix)
sample aglycone	46	23	
sample of Cyanidin	46	22	

The only known anthocyanidin conforming to all of these figures is Cyanidin.

2. Organic acids.

The anthocyanin sample was subject to alkaline hydrolysis then re-acidification.

a) The re-acidified anthocyanin was chromatographed on Whatman No. 1 paper using 3 separate solvents and compared with the original sample extract.

In 3 solvents (refer appendix).

	BAW	*1%HCL*	*HOAc/HCL*
sample glycone as extracted	29	42	70
after removal of organic acid	14	39	61

The change in R_f values indicates the presence of an organic acid.

b) The organic acid removed from the anthocyanin molecule is extracted from solution and then chromagraphed on Whatman No. 1 paper along with authentic samples of organic acids. Again three separate solvents were used.

In 3 solvents (refer appendix).

	nPOH	*JPOH*	*BMA*
organic acid isolated from sample	48	22	68
p-coumaric acid	47	19	72

The conclusion is that the organic acid attached to the anthocyanin is p-coumaric acid. This was further confirmed by observing the chromatogram under U.V. (360 nm) with ammonia fuming and colour reaction with sulphanilic acid.

3. Sugars.

The original purified extract was subject to acid hydrolysis to remove the sugar/s from the molecule and also to oxidation by hydrogen peroxide and potassium permangante (after the method of Chandler & Harper 1961). This latter method separates sugars attached to the 3 position of the molecule from those attached at other positions. The 3 position is shown in Fig. 1 and is a very common attachment point for the sugar molecule.

Chromatography of all sugar isolates against authentics showed glucose to be the only sugar present and attached, probably, to both the 3 and 5 positions.

4. A sample of the original purified extract was examined
a) for maximum absorption and found to be 523 nm
b) $\frac{\text{maximum absorption at 440 nm}}{\text{maximum absorption at 523 nm}} = 23\%$
a value consistent with a diglycoside.
c) by chromatography using four solvents and compared to published figures for likely anthocyanins, i.e. those containing cyanidin, glucose as the only sugar and an organic acid.

In four solvents (refer appendix).

	BAW	*BuOH/HCL*	*1%HCL*	*HOAc/HCL*
sample of glycone as extracted	29	21	42	70
Raphanusin C	34	21	40	68

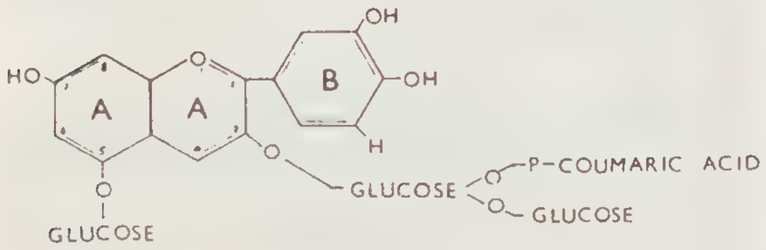

FIG 2

Fig. 2: The formula for Raphanusin C. In addition to the extra attachments at position 3 another glucose molecule has been attached to position 5, replacing the Hydrogen normally attached to the Oxygen at this position as in Fig. 1.

The conclusion, therefore, is that the floral anthocyanin of *Thelymitra ixioides* is Raphanusin C, the common name for Cyanidin 3 (coumaroyl sophoroside) 5 glucoside. The sugar unit being 3GG5G. That is there are two glucose units, forming the sugar sophorose attached to the number 3 position (along with the organic acid) and one glucose unit attached to the 5 position. See Fig. 2.

Raphanusin C was first isolated from radish roots *(Raphanus sativus)*.

Acknowledgements:

The author wishes to thank Mr Phil Collin for some helpful suggestions on presentation.

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Appendix:

Composition of solutions referred to in text.

Forestal — Acetic acid, HCL (10N), water, 30:3:10
Formic — Formic acid, HCL (10N), water, 5:2:3
BAW — n Butanol, Acetic acid, water, 12:3:5 age for 24 hours, monophasic to 0°C; rather better than the usual top layer of 4:1:5
1% HCL — HCL (10N); water, 3:97
HOAc/HCL — Acetic acid; HCL (10N) water, 15:3:82
nPOH — n propanol, Ammonium hydroxide, 7:3
JPOH — iso propanol, Amm.hydroxide, water, 20:1:2
BMA — Benzene, Methanol, Acetic acid, 27:5:2.5
BuOH/HCL — n Butanol, HCL (2N) 1:1, top layer aged 24 hours. Equilibrate paper 24 hours with lower layer.

34 Leuna Avenue
December, 1979 WAHROONGA, 2076

A NATIONAL AWARD

FOR THE BEST NATIVE SPECIES ORCHID AND BEST HYBRID ORCHID OF THE YEAR

by James Walker, President A.N.O.S.

The Council of A.N.O.S. has decided to grant annual awards for the best native species orchid and for the best hybrid made from native orchids or hybrids of native orchids. To ensure that degree of excellence which we require it has been decided to restrict each Group/Society to one entry in each class annually.

We seek to grant awards to plants which know no peer in Australasia at the time. The scheme will not have succeeded if a common topic of conversation becomes — "Did you see what won the award ? . . . Joe Smith has a much better one !"

The entries are restricted to A.N.O.S. members. At first this restriction may seem harsh, but surely if a person has a superb plant then he will not object to joining A.N.O.S. Secondly the plants are to be judged using A.N.O.S. standards, not A.O.C. standards. If the award were unrestricted, then A.O.C. standards would have to apply and A.N.O.S. does not accept that those standards are adequate. The standards to apply are reprinted at the end of this article.

Does the scheme penalise the isolated member ? Unfortunately, yes. The only hope we can offer is for those members to: —

1. Join an orchid society and have that society affiliate with A.N.O.S., or
2. Form a new group.

The award is to be for excellence. It is therefore necessary that plants be first judged at monthly meetings using the A.N.O.S. standards so that the candidates are not selected by "popular vote" which is prone to undue influence by prejudice or lack of experience. An entry fee of $5.00 per class will be payable by the submitting Group/Society. In return for this fee, the Group/Society will receive eight (8) slides for their library, i.e. two each of the winner and

runner-up. Copies of other entries will be available for a fee.
OWNERSHIP: This area has been tightened considerably to avoid any possibility of plants, recently removed from the bush or purchased, being submitted.
HYBRIDS need not be registered with the R.H.S. — at this stage. The award will be a trophy of suitable design and a cash prize. Entry forms will be posted to each participating Group and Society in December of each year.

CONDITIONS OF THE NATIONAL AWARD SCHEME

Exhibitor

To be a full financial member of A.N.O.S.

The exhibitor may be an individual or co-owners, but membership of a group or affiliated society *only* is insufficient qualification to exhibit.

The exhibit is to be submitted to A.N.O.S. on behalf of the exhibitor by a Group or Affiliated Society (these being as listed in *The Orchadian,* journal of A.N.O.S., every quarter.

Exhibit

An exhibit shall consist of five (5) original colour transparencies taken on *35 mm colour reversal film* and shall be —

1. full front face of flower, together with centimetre scale,
2. profile of flower,
3. rear of flower,
4. whole plant — suitable elevation,
5. full spike or raceme — Three-quarter profile as seen in item 4 above.

The following rules shall apply: —

a) A member shall not judge his own exhibit nor be present at the judging of the exhibits when he is participating.
b) All slides submitted become the property of A.N.O.S.
c) Native hybrid exhibits must list the parentage.
d) All slides shall be clearly identified with the exhibitor's name and the name of the group/affiliated society.
e) For all plants submitted, the flowers and buds must be free of malformation, blemish, injury, insect damage or disease.
f) Ownership: The plant must have been owned for *12 months prior to submission to the Group or Affiliated Society* and A.N.O.S. may require proof as to the length of time of ownership.
g) Each group/affiliated society shall be entitled to nominate only one exhibit for each class in each year.
h) The A.N.O.S. judging panel shall be comprised of the judges as listed in *The Orchadian.*
i) The Registrar of Judges shall have the right to reject any entry on account of its not being made on the prescribed form before the closing date, or inadequate or unsatisfactory photographs, or photographs not adequately identified.
j) The Judging Panel reserves the right to withhold an award if the standard of excellence has not been achieved.

Entry

The entries on the prescribed form are to be *in the hands of the Registrar of Judges by the last day of February* in each year.

Standards

The standards prepared by A.N.O.S. and as contained in *The Orchadian* Vol. 4, No. 10, pages 86-87, shall apply. These have been reproduced below.

Substitution

Groups/Affiliated Societies may substitute entries in either class at no additional fee, provided that such substitute is in the hands of the Registrar of Judges by the closing date prescribed.

Entry Fee

Shall be $5.00 per class, payable by the submitting group/affiliated society.

Commencing Date

The scheme commences on 1st March, 1980 and hereafter recommences on 1st March in each year.

Announcement of Awards

The results for each year shall be announced at the Annual General Meeting by the President and reported in the September issue of *The Orchadian.*

Award Publicity

The Orchadian will publish photographs of each winner and each runner-up, and an announcement as to which groups/affiliated societies were involved. The points awarded to winners and runners-up will be published.

STANDARD FOR AUSTRALIAN NATIVE ORCHIDS

Definitions: A Native Orchid is one found growing on the Australian mainland, Tasmania, or any coastal island under the political control of an Australian State, but does not include those from Trust Territories.
Not to include either natural or horticultural hybrids.

The exhibit:	An exhibit must be well established, and of an improving nature. It must not show signs of being recently collected. Terrestrial — any number of plants of the one species in the one container; Epiphyte — a plant in a container or any other medium of display to be judged as a whole. Where clonal differences are apparent the exhibitor may be called upon to nominate the plant to be judged.	
Shape:	To be of optimum standard within its own species	30 points
Colour:	Shall include white or any other colour or combination of colours. It should be clear, glistening and fresh, not smudgy or blurred. All markings should be well defined.	30 points
Size:	To be of optimum standard within its own species.	10 points
Texture:	The flower or flowers shall be of good texture, fresh, lustrous and without blemish.	5 points
Floriferousness:	The flower or flowers should be well displayed. If more than one flower is normally produced, all flowers should be of even and comparable standard. If it is the habit of the species to open progressively along the inflorescence, only fresh and open flowers are to be judged.	15 points
Habit of Inflorescence:	The stem should display the flower or flowers to the best advantage. They should be evenly distributed.	10 points

STANDARD FOR AUSTRALIAN NATIVE ORCHID HYBRIDS

Definitions: An Australian Native Orchid Hybrid shall be the progeny of only Australian Native Orchids as defined under standards for Australian Native Orchids.
To include natural hybrids.

The exhibit:	Terrestrial — any number of plants of the one grex in the one container; Epiphyte — a plant in a container or any other medium of display, to be judged as a whole. Where clonal differences are apparent the exhibitor may be called upon to nominate the plant to be judged.	
Shape:	Shall be considered to be an improvement on either or both the parents.	25 points
Colour:	Shall include white or any other colour or combination of colours. It should be clear, glistening and fresh, not smudgy or blurred. All markings should be well defined.	20 points
Size:	To be relative to the optimum for the parents.	20 points
Texture:	The flower or flowers shall be of good texture, fresh, lustrous and without blemish.	5 points
Floriferousness:	The flower should be well displayed. If more than one flower is produced, all flowers should be of even and comparable standard. Total yield should be taken into account.	15 points
Habit of Inflorescence:	The stem should display the flower or flowers to be the best advantage. They should be evenly distributed.	15 points

Awards for Australian Native Orchids

by David Banks

As mentioned in the December, 1979 issue, I undertook to give a review of awards over recent years granted to Australian Native Orchids (species and their hybrids). I will restrict this review to the major awards, i.e. Highly Commended Certificate (HCC), Award of Merit (AM) and First Class Certificate (FCC). Over the years, several Cultural Certificates have been granted by the various State Orchid Societies, however, I have not included them in this listing as I wish to concentrate on those plants whose flowers were adjudged to be of superior quality.

State awards have invariably been further submitted to the Australian Orchid Council (A.O.C.) seeking a National Award, so the awards that follow are in fact A.O.C. awards.

Before proceeding to outline the details there are two points that I would like to make: —

a) I have often heard it said, and at times by people who should know better, that it is no use submitting Australian native species or hybrids for State Awards because, unless the flower is round and well filled in, it has no chance of gaining recognition. **THIS IS CERTAINLY NOT THE CASE.** The A.O.C. standard **for species** requires that the flowers "be symmetrical about a vertical plane and optimum shape within its own species. Broad segments are an advantage". There is no suggestion that flowers should be other than balanced, i.e. if a line were drawn vertically down the centre of the flower, both sides should be symmetrical. Broad segments are an advantage — **NOT** a necessity. The A.O.C. standard for hybrids has one addition to the species standard — the shape "shall be an improvement on both parents".

There is absolutely no reason why a plant of, say, *Dendrobium tetragonum var. giganteum* could not receive a major award — providing its flowers met the basic requirements as outlined in the awards.

The above comments relate to requirements for shape. The other aspects such as colour, size, texture, floriferousness and habit of inflorescence have a bearing on whether a plant gets an award — although shape and colour are very important. If the flower fails to gain 75% of the maximum points under both shape and colour, the award does not apply, even though overall points may exceed the 75 point minimum for an HCC award. The following are the number of points needed for each award:

HCC	75 — 80
AM	80 — 85
FCC	85 — 100

Under the A.O.C. standard, Australian natives and/or their hybrids are able to hold their own against our exotic cousins. As an example a plant of *Sarcochilus hartmannii* "Kerri" was best "Any Other Orchid" (i.e. other than a Cymbidium) at the Five Dock Orchid Society (N.S.W.) Spring Show 1979. *Dendrobium kingianum* "Bungan Castle" was Reserve Champion at the O.S.N.S.W. Spring Festival at Roselands 1979. I am told "natives" gained high honours at other shows during 1979.

b) I am fortunate that I am able to get around to quite a few shows/meetings etc. during the season. So very often I hear comments such as "I've got a much better one at home". So help me, why wasn't it brought to the meeting or show ? If plants are never displayed they will never win prizes or gain awards !

As new awards are given I will give the details in *The Orchadian.* I would be happy to hear from people in states other than N.S.W. if awards have been given there. In America, *Dendrobium kingianum* "Ruth" (which is really *D. kingianum* "Albert West") received an AM a few years ago. On 25.8.77, Mrs Pat Jagger received and HCC/O.S.N.S.W. with Dendrobium Ellen "Jayhurst", but this did not get the AOC award.

Now to the AOC award details: —

1. **Dendrobium Bardo Rose "Berowra" H.C.C./A.O.C.**

Owned by Mr Ron Kerr, gained an H.C.C. from the O.S.N.S.W. on 15.9.75. It subsequently gained the same award from the A.O.C. The flower was white but unfortunately I do not have the details of flowering, flower size, etc.

2. **Sarcochilus falcatus "Miriam Ann" H.C.C./A.O.C.**

Owned by Mr Alan Merriman, gained an H.C.C. from the O.S.N.S.W. on 28.11.77. It subsequently gained the same award from the A.O.C. The plant carried two spikes with 6 and 8 flowers respectively. Flowers pure white, 30 mm across the petals and 31 mm in depth. The plant received 77.65 points in gaining the award.

3. **Dendrobium Bardo Rose "Teresa" H.C.C./A.O.C.**

Owned by Mr Col Brandon, gained an H.C.C. from the O.S.N.S.W. on 16.9.79. A similar A.O.C. award followed. The plant had 9 bulbs carrying 7 upright inflorescences well clear of the foliage. Individual flowers were of good shape for the type and pink segments were wide and open and were 30 mm across the petals. Received 75.36 points in gaining the award.

4. **Dendrobium speciosum "National White" H.C.C./A.O.C.**

Owned by Mr Col Brandon, gained an H.C.C. from the O.S.N.S.W. on 16.9.79. A similar A.O.C. award followed. A 5-bulb plant having two spikes, aggregating 167 flowers. The flower spikes were erect and well clear of the foliage. Flowers white, flat and segments very evenly spaced, 43 mm across the petals and 54 mm in depth.

5. **Dendrobium kingianum "Bungan Castle" A.M./A.O.C.**

Received an A.M. with the O.S.N.S.W. on 16.9.79 for Mr Eric Webeck. The A.O.C. granted a similar award. Received 80.66 points in gaining the award. Sepals and petals were purple-red and flower was 14 mm across the petals and 23 mm across the vertical sepals.

6. **Sarcochilus hartmannii "Kerri" A.M./A.O.C.**

Owned by Mr J. Williams, received an Award of Merit from the O.S.N.S.W. on 4.10.79. A similar award from the A.O.C. followed. Gained 80.25 points in achieving the award. A large plant with 16 spikes and approximately 320 flowers. Flowers were 31 mm across the petals.

34 Gideon Street
WINSTON HILLS, N.S.W. 2153

HYBRIDISING WITH COOL GROWING AUSTRALIAN DENDROBIUMS

by Roger B. Bedford

(Reprinted with permission of the author, from the Journal of the Darling Downs Group of A.N.O.S.)

Before we can properly discuss this subject it is necessary to have at least some understanding of the genus Dendrobium as it occurs in Australia. There are three Dendrobium sub-genera which occur in Australia. These are: —

a) ANTHECEBIUM — leaves without sheathing bases.
b) EU-DENDROBIUM — leaves with distinct sheathing bases and fleshy stems.
c) XEROBIUM — leaves with distinct sheathing bases and wiry stems.

These sub-genera are further broken down into sections as follows: —

ATHECEBIUM

Section 1: **Rhizobium** — *linguiforme, cucumerinum*
Section 2: un-named — *lichenastrum, toressae*
Section 3: un-named — *teretifolium, striolatum, pugioniforme*
Section 4: **Monophyllaea** — *monophyllum, schneiderae*
Section 5: **Dendrocoryne** — *speciosum, kingianum, falcorostrum, tetragonum*
Section 6: **Latouria** — *bairdianum, bifalce*

EU-DENDROBIUM

Section 7: **Phalaenanthe** — *bigibbum, dicuphum*
Section 8: **Eleutheroglossum** — *canaliculatum*
Section 9: **Ceratobium** — *antennatum, discolor, johannis*
Section 10: **Eugenanthe** — *stuartii*
Section 11: **Trachyrhizum** — *agrostophyllum*
Section 12: **Pedilonum** — *smillieae, ophioglossum*

XEROBIUM

Section 13: **Grastidium** — *baileyi, cancroides*
Section 14: **Monanthos** — *malbrownii*
Section 15: **Conostalix** — *lobbii*

We have been hybridising now for about 25 years and by far the greatest number of hybrids produced have been within the Dendrocoryne section of the sub-genus Athecebium. A little hybridisation has occurred between Athecebium and Eu-Dendrobium; and Xerobium has not been and is not likely to be, used at all.

Having briefly discussed this rather technical aspect of the genus Dendrobium we must ask the question: "Why do we hybridise?" The answer of course is to improve upon the species; but this is too simple an answer because according to normal judging standards we must produce a well rounded flower with broad segments. Working on this premise we must produce a race of 'look-alike' flowers irrespective of their genus. The first breakaway from this rigid rule came in the Ceratobium section where there are now separate judging standards for the 'antelope' type flowers. We now also have a similar situation with our native Dendrobiums where we are looking more to the aesthetic value of the flower with the actual shape being less important than improvement on both of its parents; more specifically we are looking for colour, floriferousness, display and a *pleasing* shape. It is a pity that perfume, frequency of flowering and vigour cannot be included in judging standards. This is not a criticism because I realise the impossibility of such a scheme but nevertheless these factors bear a very strong influence upon the desirability of a plant.

I now wish to discuss some of the more commonly used species used in hybridising, and then finish with a brief look at the future. You will appreciate that in the space available I can only discuss these subjects rather broadly, but I hope in enough detail to give you an idea of what has been and is being done in this field of hybridisation and perhaps to create an interest amongst you to grow a few more of these rewarding plants.

Dendrobium kingianum:

Probably the most widely used parent to date has been *D. kingianum* and this is probably the biggest mistake made by most hybridists in the 1950's and 1960's and it is still being made today. Generally speaking the shape, size and colour of *D. kingianum* is dominant, let me illustrate this by asking if you have ever seen a D. Bardo Rose as big as *D. falcorostrum.* Even D. Bardo Rose x *D. falcorostrum* is still smaller than *D. falcorostrum.* Another example of the dominance of *D. kingianum* would be *D. delicatum,* where practically all plants are pink or white. I have only ever seen two yellow flowered plants, and one of these was a natural hybrid. *D. kingianum* is nevertheless necessary in any long range hybridisation programme but only as a very small percentage of the parentage and, I think, not until the third or even fourth generation. A few years ago I attempted to obtain some pinks as good as D. Peter *(D. fleckeri x D. falcorostrum)* and so crossed D. Peter with *D. kingianum.* The situation here is a large orange crossed with a large white which produced a large, perfumed, pastel orange which flowers up to nine times per year. This in turn was crossed with the smaller pink. The influence of *D. kingianum* was so strong that I did not get a single orange flower, neither did I get any flowers as big as those of D. Peter. I got a few white flowers, usually with dark coloured labellums, and the balance were pale to dark pinks. The average quality was very good with a few exceptionally good dark pinks and whites. I have now created a series of back crosses to D. Peter and *D. falcorostrum* in an attempt to further improve the standard of pink flowers.

D. adae has been used with *D. falcorostrum* — I believe with some success. *D. fleckeri x D. adae* produced some good yellow colours but the flowers were all rather small. A further cross of *D. fleckeri x D. adae* to D. Hastings *(= kingianum x fleckeri)* did not produce a flower worth benching.

D. aemulum was used with *D. kingianum* to produce D. Emmy. This has always been one of the most popular crosses having small but pretty pink or white flowers. I also have two seedlings of *D. aemulum x D. speciosum,* but although I have had them for many years I have been unable to get them to make any growth.

D. x delicatum has been used as a parent (both natural and man-made plants) but mostly the results have been poor. It is interesting to note that it has been crossed with *D. x superbiens* to produce D. Elsie Cox and has therefore the distinction to be the first registered hybrid to be created between three different sections of the genus Dendrobium. Other inter-sectional crosses have been achieved such as D. Willowie Gold *(D. tetragonum* var. *giganteum x D. discolor),* D. Peewee *(D. bigibbum x D. tetragonum* var. *giganteum)* and two un-named hybrids *D. speciosum* var. *hillii x D. canaliculatum* and *D. aemulum x D. canaliculatum.* There have also been inter-sectional crosses with the Dendrocoryne and terete-leaved sections, and with Dendrocoryne and Trachyrhizum Sections. I have not seen the flowers of all of these crosses but the ones I have seen have been a little disappointing but nevertheless show promise for further breeding.

D. fleckeri has probably been the most successful parent found so far and has produced a number of hybrids with lovely yellow to orange flowers. It has been used with *D. falcorostrum* to produce D. Peter, with *D. kingianum* to produce D. Hastings and also with *D. speciosum* and *D. ruppianum* var. *magnificum* to produce two other un-named but top hybrids. I have recently been using *D. fleckeri* and its primary hybrids with some of the crosses containing *D. tetragonum* var. *giganteum* in an attempt to increase size and broaden the segments but as yet no plants have been flowered.

D. falcorostrum has been used in a number of successful crosses and always tends to improve shape and size without having much effect on colour.

D. tetragonum is probably the last species requiring mention here. It has been widely used as a parent in recent years producing an attractive range of large, often yellow flowers frequently spotted or blotched with red. The flowers have narrow segments but usually have broad and attractive labellums. When used with *D. kingianum* it produces D. Ellen which, although very attractive and producing a wide variety of colours, lacks size. All these newer crosses have been made with the *giganteum* variety which has not only imparted the size but also the pleasing ability — to varying degrees — to flower at any time of the year.

In the terete-leaved section there have been a number of crosses between species such as *D. cucumerinum, D. striolatum, D. teretifolium* and *D. pugioniforme,* in my opinion, with a marked lack of success. The flowers in this section tend to be very similar in shape and size and so I believe that little can be expected except differing growth forms. *D. linguiforme* has been used with a little more success because the flowers, although small, are racemose and therefore when used as a parent it tends to improve the floriferousness of the other parent.

THE FUTURE: If we take a glimpse into the future we shall see a great deal of work being done by a small band of hybridists, most of them aiming in different directions, but I think basically we shall see more work done with the Phalaenanthe and Ceratobium Sections linking them with the Dendrocoryne Section in an attempt to produce cool growing 'tropical' type flowers. At least one hybridist is creating a series of crosses with the terete-leaved species, and I am concentrating on improving the shape, size and colour of the Dendrocoryne Section. If we are looking for new peaks to climb and are looking for the ultimate in traditional shape, and have the patience to pursue a very lengthy breeding programme, there are three notable species that have really not been used at all. The first is *D. monophyllum,* very wide segments, clear yellow colour, and a rather interesting labellum. The second is *D. agrostophyllum,* which has similar characteristics to *D. monophyllum* but has a magnificent labellum, but being the Eu-Dendrobium sub-genus it has been found hard to use as a parent. I only know of it being used successfully with *D. X gracillimum* and *D. speciosum* and to the best of my knowledge none of the plants have, as yet, been flowered. *D. bairdianum* I regard as the third species of the future because of its broad segments, green coloured flower and large purple labellum. Unfortunately it is once again rather small flowered.

In closing may I make a plea to all current and budding hybridists to select before they breed; that is to select clones with especially desirable characteristics and to breed with a definite purpose in mind. Anyone can cross A with B and grow rubbish but it needs self-discipline, patience and a long range plan to grow good orchids.

October, 1979

37 Alan Avenue
SEAFORTH, N.S.W. 2092

TERRESTRIAL CULTURE NOTES

by L.T. Nesbitt

I am favoured by living in a State with a climate that suits terrestrial orchids. I also have two growing areas 35 km apart, one at Vale Park on the Adelaide Plains at an altitude of 15 m, and the other at Kersbrook (altitude 340 m) in the Mt. Lofty Ranges. The Kersbrook site is subject to heavy frosts in Winter, whereas frosts are very rare these days at Vale Park due to widespread space heating and a blanket of smog over the city. The most noticeable effect is the earlier growth and flowering at Vale Park: up to six weeks in some cases. For example *Diuris maculata* flowers in the last week in August at Vale Park; yet at Kersbrook it is at its best in the last week in September. *Pterostylis nutans* flowers in June—August at Vale Park and August—October at Kersbrook. On the other hand, *Eriochilus cucullatus* flowers at the same time in both locations (April—May).

Most species seem able to stand the heavy frosts at Kersbrook provided they are not taken there during the growing season. Pterostylis grown in frost-free areas have lush green, almost succulent leaves. At Kersbrook pterostylis leaves are tough, as thin as tissue paper and a bit on the yellowish side. Leaf veins are prominent. Tubers form normally. Some species such as *Acianthus reniformis, Caladenia latifolia* and *C. menziesii* get frost-bitten on the ends of the leaves whilst the remainder of the leaf takes on a silvery appearance. Other frost-sensitive plants are *P. alata var. robusta, P. baptistii* and *P. ophioglossa.* Diuris, Thelymitra, and the hairy leafed Caladenias are not the least bit affected by frost. In fact the sun orchids do not suffer so severely from leaf rot at Kersbrook.

I have tried about 50 terrestrial species to date at Kersbrook so the frost-sensitive list is far from complete. In fact the cultural adaptability of many of our terrestrial orchids is unknown to me. It was only recently that I reached 100 species in my collection out of a possible total of some 350 species. Possibly 150 species are very rare in nature and will not survive without their specialised micro-climate, soil, and associated plants, organisms, etc. There still remain 100 species. Where are they? Is somebody growing them successfully? A.N.O.S. Victoria has shown the lead with its programme to try to cultivate every Pterostylis species. They appear to be well on the way judging from the material reaching this State from Victoria.

Pterostylis is widely recognized as the easiest genus to grow. Some species multiply so rapidly that they become an embarrassment after a few years. In South Australia I put *P. curta, P. nutans* and *P. pedunculata* in this category. There are exceptions to every rule and the difficult pterostylis in my experience are *P. longifolia, P. plumosa* and *P. vittata.* These species do not multiply vegetatively and therefore must be propagated by seed. I have germinated seed around 'mother' plants of each of these three species but seedlings do not appear every year and very few seedlings survive the first Summer. Mature plants have a survival rate of about 0.8 — 0.9 so they eventually die out if seedlings are not raised to make up for losses. I have not had much experience with the rufa group but it appears that they do not form colonies by vegetative increase. Flasking with fungal cultures may be the answer for difficult species but this method is still in its infancy and the techniques are not widely known.

Greenhoods which do not seem to be in cultivation in the southern states are: *P. allantoidea, P. carinata, P. ceriflora, P. conglossa, P. constricta, P. daintreana, P. furcata, P. furcillata, P. oreophila* and *P. sargentii.* Of course the names of some of these plants are in doubt and I guess botanists will argue for a long time to come. The important thing is to have many populations of each type growing in both the wild state and in cultivation. A bank of seed in long term storage is also a wise precaution in case of 'accidents'.

Terrestrial Hybrids:

The 1979 season was notable for the several pterostylis hybrids which were seen at NOSSA meetings. *P. curta x P. nutans,* raised by R. Nash, was available on the trading table early in the season. Dubbed 'curtains' by a local sage, it is easy to grow and flower and appears to have an extremely high increase rate of 4 or 5. If this is maintained it will be curtains for every novice grower in future.

A large impressive colourful flower resulted from *Pterostylis baptistii x P. cucullata.* This cross is also reported to grow easily and multiply. Harold Goldsack raised this hybrid by sowing seed around single plants of *P. curta* growing in margarine containers full of peat moss.

Like it or not, terrestrial hybrids are coming !

18 Cambridge Street
VALE PARK, S.A. 5081

Who's Who

THE AUSTRALASIAN NATIVE ORCHID SOCIETY OFFICERS AND GROUP CONTACTS:

A.N.O.S. Council:
President: J.A. Walker; Vice-President: E. Gordon; Secretary: D. de Silva; Asst. Secretary: Nola Martin; Treasurer: E. Husted; Editor: J.J. Betts; Asst. Editor: P. Weston; Councillors: P. Collin, M. Harrison, F. Martin.

A.N.O.S. Group Officers and Affiliated Societies extensively interested in Native Orchids:

NEW SOUTH WALES

- *Sydney Group:* Tel.: (02) 53 5956
  Meets 8 p.m. 2nd Friday each month, Ryde School of Horticulture, 59 Parkes Street, West Ryde.
- *Warringah Group:* Tel.:(02) 99 2468
  Meets 8 p.m. 2nd Thursday, Stony Range Flora Reserve, Pittwater Road, Dee Why.
- *Newcastle Group:* Tel.: 48 9109 — Meets 4th Wednesday, John Young Community Hall, Thomas Street, Cardiff.
- *Wollongong & District:* Secretary: Mrs E. Beileiter, 19 London Street, Berkeley, 2506.
  Meets 2nd Tuesday at the Meeting Room of the Wollongong Town Hall.
- *Hastings Valley Group:* Tel.: Wauchope 856 — Meets 7.30 p.m. 4th Friday at Beechwood Uniting Church Hall.
- *Central Coast Group:* Tel.: (043) 24 4435
  Meets 7.30 p.m. 2nd Wednesday at the Teachers Resource Centre, Georgina Terrace, Gosford.

VICTORIA

- *Victorian Group:* Tel.: (03) 754 6585
  Meets 8 p.m. 1st Friday at the National Herbarium, Royal Botanic Gardens, Melbourne.

QUEENSLAND

- *Darling Downs Group:* Secretary: Mrs J. Leyden, 66 Mort Street, Toowoomba, 4350. Tel.: (076) 34 2813
  Meets 7.30 p.m. 3rd Friday at the Auditorium of the Technical & Further Education Centre, Old Empire Theatre, Neil Street, Toowoomba.
- *Native Orchid Society of Queensland (Affiliated):* c/- P.O. Box 159, Broadway, Qld. 4000.
  Meets 8 p.m. 1st Monday at Bread House, 49 Gregory Terrace, Brisbane.

SOUTH AUSTRALIA

- *Native Orchid Society of South Australia (Affiliated):* Secretary: E.R. Hargraeves, I Halmon Avenue, Everard Park, 5035 Tel.: (08) 293 2471 or 297 3724 — Meets 4th Tuesday, St. Matthew's Hall, 67 Bridge St., Kensington.

WESTERN AUSTRALIA

- *W.A. Native Orchid Study and Conservation Group (Inc.) (Affiliated):* Tel.: (09) 337 9614
  Meets 1st Friday at the Department of Agriculture's Film Room, Jarrah Road, South Perth.

NORTHERN TERRITORY

- *The Orchid Society of the Northern Territory (Affiliated):* Secretary: Mrs G. Heinemann, Tel.: 85 4624,
  P.O. Box 38493, Winnellie, N.T. 5789

AFFILIATED SOCIETIES

Berowra & District Orchid Society
Blue Mountains & District Orchid Society
Brisbane Orchid Society
Bundaberg Orchid Society
Cumberland Orchid Circle
Hastings River Orchid Society
Illawarra & District Orchid Society
Manawatu Orchid Society (New Zealand)
Manning River Orchid Society
Maroochydor Orchid Society
Maryborough & District Orchid Society
Newcastle Orchid Society
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(diam. 27 mm)

D. adae x D. gracilicaule var. howeanum (diam. 25 mm)

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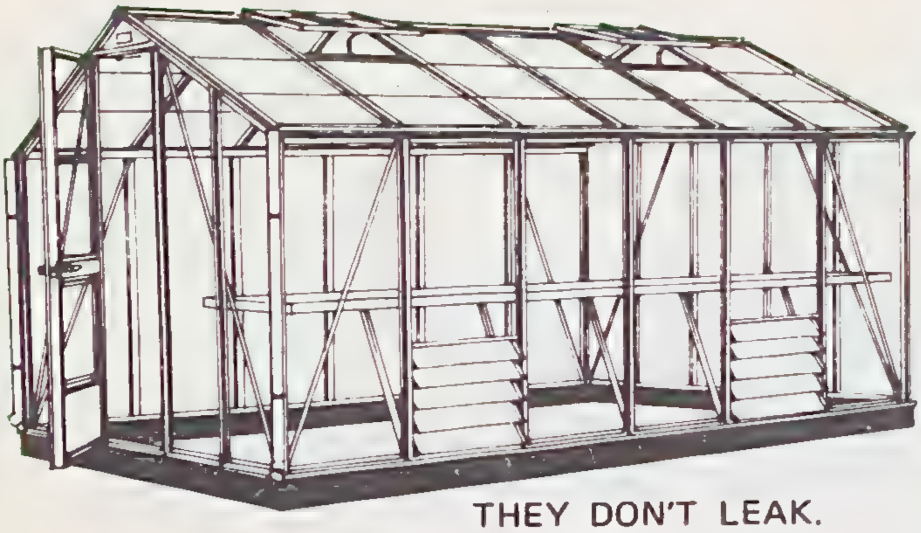

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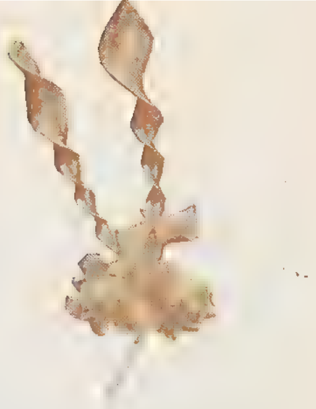

Dendrobium helix Cribb

Patron: James H. Willis

JUNE, 1980

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Date this issue distributed:
30th June, 1980

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THE ORCHADIAN

Founded August, 1963

Editor: J.J. Betts
Honorary Associate Editors: Dr N.J. Grundon (Qld.), Mr J. Simmons (S.A.)

Volume 6 June, 1980 No. 8

EDITORIAL

Winter again — the time of dormancy. But even at this time *Dendrobium schneiderae* and *D. mortii* make a showing — small, but graceful. And of course the early greenhoods are in full bloom for some of us. Nevertheless, the general scene in the shadehouse is somewhat dull. Even the man-made hybrids like D. Ellen, D. Star Imp and D. Hilda Poxon and other offspring of *D. tetragonum* cannot be counted upon with certainty for a big display — though it is true that you will generally find one or two plants flowering at this time.

Dormancy implies awakening. Looking more closely at the winter scene in early June three weeks before the shortest day, you can actually see the renewal starting just when you are still digging in for the long winter ahead. In Sydney it seems only a few weeks since you put on the extra protection against cold, frost and rain; yet there are flower spikes starting up not only in the *Sarcochilus hartmannii* but also in *Dendrobium X delicatum* and its relatives! "Renewal" you say; and that reminds you: it is renewal time for your subscription to ANOS, too! So you decide to make it an early Spring for the Treasurer . . .

We are privileged to have in this issue an early report from Dr P.S. Lavarack on the results of the February/March, 1980 Wet Season Expedition to Iron Range. We shall have more on this in due course.

Dr P.J. Cribb's paper "Three New Species of Dendrobium Section Ceratobium" is another first-release for *The Orchadian.* This article is of special significance in that the R.H.S. Registrar of Orchids is about to use the new species names for new hybrids. Our illustrations are last-minute inclusions received as we go to print.

The "King Orchid", *Dendrobium speciosum,* gets the welcome attention of Ted Gregory this quarter. We tend to take it for granted. People who scarcely know it as an orchid, grow the "Rock Lily" around the bases of trees in the garden. But surely it is among the most magnificent orchids in the world. Ted Gregory's article is very timely; for on this subject, too, we shall have more, towards the end of this year when Steve Clemesha will give us a very thorough definitive review of this species, its varieties, forms and habitats. *D. speciosum* deserves this attention! Remembering his important "Review of *D. bigibbum* Lindl." (*Orchadian,* December 1978, pp 27-33), Mr Clemesha feels that for the latter the problem was that too much had already been published. For *D. speciosum,* on the other hand, he feels that "it is all relatively unstudied"'. We look forward to his paper for our December 1980 issue.

In the meantime (September issue) you may count on getting a major botanical contribution from T.M. Reeve and P.J.B. Woods, entitled "A Preliminary Key to the Dendrobium Section Oxyglossum". The title is rather too modest. Collectors and students of the Papua New Guinea highland species have, for many years, wished for clarification of the taxonomy — especially of the Oxyglossum section of the genus. In this paper we shall have an ideal collaboration between Tom Reeve, as a field botanist who has lived for years with his subject matter, and Paddy Woods, botanist at the Royal Botanic Garden, Edinburgh, and a recognised authority on the orchids of Papua New Guinea. It is indeed a privilege to have their work in a "preliminary" form suitable for the general reader, published first in *The Orchadian.* It will occupy the greater part of the September issue; so we trust that other contributors will understand if we have to defer some excellent articles until later. On the other hand we may increase the size of the journal for the occasion.

On Spring Shows for 1980: We have given publicity in this issue to those Groups that have sought it (see page 181). There are, of course, many others and we suggest that readers beyond New South Wales may like to make use of our "Who's Who" directory to obtain details for other Groups. Those who read our "Letters to the Editor" will recall a recent suggestion that a photographic competition would augment the Spring Shows with photographs of orchids not in flower at that time. You will notice that the Blue Mountains and District Orchid Society has just such a section in their show and they have had this for the past two years. Our readers will not be surprised to learn that in both 1978 and 1979 photographs of Australian native orchids won the prize. The photographers were Phil Collin and Garry Wells. The organisers of the Blue Mountains Show emphasise that the prize is not necessarily for pictures of prize — or award — winning orchids nor for dramatic or artistic effects, but rather for excellence of portrayal of the subject matter.

FEEDBACK AND FOLLOW-UP

- As I have said before, it is good news for the Editor when he hears of correspondence flowing between members as a result of published articles. One such result, in this issue, is Andrew Brown's follow-up of Peter Vaughan's recent piece on *Pterostylis barbata* and *P. plumosa.* Another is that within a few weeks after the March issue of *The Orchadian* came out Erhard Husted had a letter from South Africa in appreciation of his "beginner's" article on terrestrial orchids of the Sydney region. This was gratifying not only to Erhard as the author, but also to ANOS Council and NOSSA because the letter came from one of the people who are growing our native tubers this year as a pilot scheme to prepare a showing for Australia at the 10th World Orchid Conference in Durban in September, 1981. Thanks to NOSSA (see editorial page in the December, 1979 issue) and their early contact with Dr Michael O'Connor of Pietermaritzburg during his visit here last October, the terrestrial part of the Australian native orchid display seems well in hand as a feasibility study. The epiphytes for the project should of course come from N.S.W. and Queensland; so ANOS Council is now looking for expressions of interest from members in those States who have impressive show bench specimen epiphytes they are prepared to part with in the interests of showing our natives off and possibly winning a medal or two. You don't have to be present at the Conference to be in it. Personally I would think the likely ones would be specimen plants of *Dendrobium speciosum, D. kingianum, D. falcorostrum, D. aemulum, D. X delicatum,* and the better known and tried hybrids like D. Ellen, Bardo Rose, Ella Victoria Leaney and *X suffusum* — rather than the less floriferous more modern hybrids like D. Peter, D. Eureka, D. Star of Gold, etc. I could be wrong. At any rate, please let ANOS Council have your own ideas early for co-ordination with NOSSA and Dr O'Connor.
- I have had no feed-back on the reception of the car stickers distributed with *The Orchadian* for March; but there has been a notable response to the ANOS membership brochure that went out for your information at the same time. The response has taken the form of (a) many new applications for membership (using the new form in this brochure) and (b) requests from Groups for supplies of the brochure.

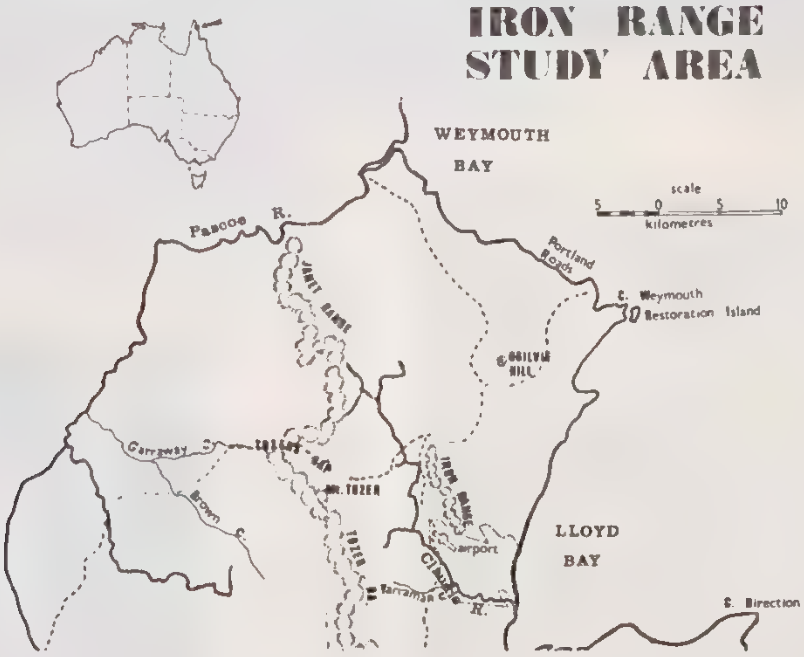
WET SEASON ORCHIDS OF THE IRON RANGE AREA

(The results of the 1980 joint Australian Orchid Foundation – Queensland National Parks and Wildlife Service Expedition to Iron Range.)

by P.S. Lavarack

INTRODUCTION: When compiling the Report on the orchids of the Iron Range area (Lavarack 1977a) it became obvious that one section of the orchid flora was being overlooked. This is the group of terrestrial orchids which flower and produce leaves after the onset of the wet season. The leaves of these species usually disappear and the plants survive the dry winter season as dormant bulbs or tubers. Therefore a field trip organised in July or August, the optimum months for access, will find no trace of these genera.

Iron Range is one of the key orchid areas in Australia. Along with the closely related, but less accessible McIlwraith Range, it is a high rainfall area surrounded by relatively dry country. It shows evidence of close links to the orchid flora of New Guinea.



The epiphytes and the evergreen terrestrials of the area are now well known. In the previous report the following terrestrial species were recorded: — *Aphyllorchis* sp. *Apostasia wallichi, Bromheadia venusta, Calanthe triplicata, Cheirostylis ovata, Corymborkis veratrifolia, Dendrobium lobbii, Dipodium pandanum, Eulophia pulchra, Geodorum densiflorum, Habenaria papuana, Hetaeria oblongifolia, Malaxis latifolia, Spathoglottis* sp., *Zeuxine oblonga.*

All these are species of rainforests or swamps and the only deciduous terrestrials recorded were the unpublished records (recorded in Lavarack 1977b) of L.J. Bass in 1948 who collected *Liparis habenarina* and *Nervilia discolor* * Terrestrial species in this category have been recorded elsewhere on Cape York. There are definite recordings from the McIlwraith Range of *Habenaria papuana* (Jones 1974), *Calochilus holtzei* (Dockrill 1969), *Malaxis marsupichila* (Upton 1976) and unconfirmed reports from the same area of *Nervilia crociformis* and *Arthrochilus irritabilis* (M. Brown pers. com.). The present author has recorded *Habenaria orhroleuca, Malaxis marsupichila* from near Bamaga (Lavarack 1977c) and *Arthrochilus dockrillii* from the Jardine River area (Lavarack 1975).

Iron Range was chosen because it is very poorly known with respect to the orchids under consideration and because access to the area is easy (if expensive) via regular flights to the Iron Range airport, which remains open in all but cyclonic weather.

THE HABITATS

The vegetation of the Iron Range area was described in detail in a previous report (Lavarack 1977a). In general terms about half the area supports rainforest with the remaining half consisting of eucalypt-dominated forest, *Melaleuca*-dominated forests and heath. The habitats which were chosen for intensive investigation on the expedition were as follows: —

(1) Heath, in particular the wet heaths of Tozer's Gap
(2) Eucalypt forest on sand near the coast
(3) Eucalypt forest in moister areas
(4) Melaleuca woodlands and forests
(5) Margins of rainforests

All these are habitats of at least some degree of seasonal water stress. Most of the area is in a relatively high rainfall belt, although there appears to be a significant rain shadow near Portland Roads on the coast. The average rainfall at Iron Range airport is 1980 mm but, while heavy rain can occur at any time of the year, it is usual for the period between May and December to be dry.

PLANNING THE EXPEDITION

Searching for wet season terrestrials is always a gamble. The flowering of the plants appears to be related to the onset of the wet season but it is not clear how much rain is required. Different species also appear to take longer to respond to the rain. *Nervilia* species would appear to respond quickly and the flowers appear to be short-lived. *Habenarias* on the other hand appear to take longer to respond and to last longer in flower. Thus to sample an area exhaustively the collector would need to be in the area from about early November to April or May. This was clearly not possible. Factors other than the weather intervened in the planning of this expedition, until finally the period between 19th February and 3rd March was chosen. As the wet season had been delayed it was felt that these dates may prove the best available; although it was realised that plants flowering early in the wet season may be missed.

For some years now the National Parks and Wildlife Service of Queensland has had an ongoing project to survey the orchids of Cape York Peninsula. The funding of this project has been greatly aided by grants from the Australian Orchid Foundation and the trip described here was jointly organised by these two bodies. The personnel consisted of Dr P.S. Lavarack, Botanist of the Queensland National Parks and Wildlife Service; Mr J. Clarkson, Botanist of the Queensland Herbarium; Mr L.J. Lawler of the

---

* now regarded as a synonym of *N. plicata* (Andr.) Schltr.

View of Tozer's Gap
February, 1980 Photo: P. Lavarack

University of Sydney: Mr M.W. Hodge of Brisbane and Mr G. McCraith, Director of the Australian Orchid Foundation. The party was housed, fed and transported by Mr & Mrs D. Holdsworth of Portland Roads who provided a base for short trips to various areas. A period of four days was spent at Tozer's Gap.

RESULTS

All the vegetation types selected contained a few terrestrial orchids. Numbers of species and individuals were disappointingly low, possibly due to a poor wet season. The most prolific habitat appeared to be moist, grassy open forest near the margin of rainforest not far from Iron Range Airport. Here three or four species of *Nevilia, Liparis habenarina* and *Geodorum densiflorum* were found.

Some other species of plants which flower in the wet season were obvious. These included *Curcuma australasica* (Cape York Lily), *Amorphophallus* sp., *Typhonium angustilobium* (Black Lily), *Drosera petiolaris* (Sundew), *Tacca* sp., and *Erycles amboinensis* (Cardwell Lily). However, small herbs such as *Stylidium* spp. and *Utricularia* spp. were not abundant and the overall impression was of very few plants flowering outside the rainforests. Whether this is the normal condition or is due to the poor wet season is not clear.

A list of the terrestrial orchids recorded on this expedition, along with some notes on each, is given below:

Habenaria ferdinandii — Three plants were collected at Tozer's Gap in heath country. All were in bud, but close to opening. This is a new record for the Iron Range area and also the first time this species has been collected on Cape York Peninsula.

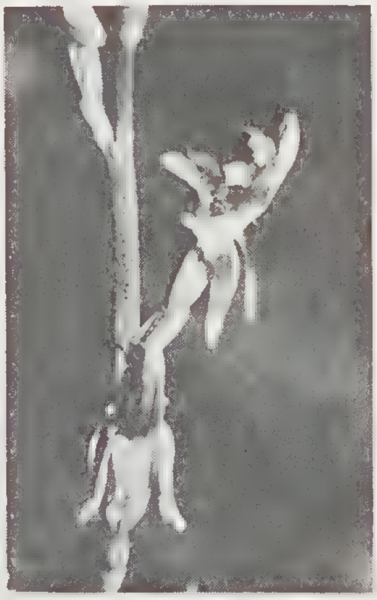
Habenaria orhroleuca — One plant in full flower was collected in 'King Park' south of the Claudie River. It was growing on the margin of seasonally swampy ground dominated by *Melaleuca viridiflora*. This was a new record for the Iron Range area, although it has been recorded both to the south and north of this area.

Calochilus sp. — Plants of this species were found at Tozer's Gap and on 'King Park' south of the Claudie River. All the plants collected were in seed and the flowers were withered. It is likely the flowering period was about early December. Most plants had only one to three flowers. A careful study of the withered flowers in the laboratory indicated that they are probably *C. holtzei*, which has previously been recorded at the McIlwraith Range as well as other areas to the south and in Arnhem Land.

Arthrochilus irritabilis — Flowering plants of this species were collected in many localities in eucalypt and *Melaleuca* forest. The plants collected had up to 20 flowers. In one or two specimens a rosette of leaves was present growing laterally from the base of the inflorescence, but usually the inflorescence was devoid of leaves. Rosettes of the same species were abundant and only a very small proportion of flowering plants was observed.

This species has not been collected north of about Cooktown previously although it does occur in Papua New Guinea.

Habitat of *Nervilia* sp., Iron Range area Photo: M. Hodge



Arthrochilus dockrillii, Chilli Creek Photo: M. Hodge

Arthrochilus dockrillii — Flowering plants of this species were collected in eucalypt forest near Tozer's Gap and in mixed forest on old dunes near the beach where it was particularly abundant. Only a small proportion of the plants seen were in flower. The inflorescence is always associated with a single leaf (occasionally 2), which is up to 12cm long and about 1cm broad.

This species has previously been collected at Kurrimine, Bloomfield River, Jardine River and Papua New Guinea. The flowering time is of interest as other plants collected flowered in June to August. This is a new record for the Iron Range — McIlwraith Range area.

Nervilia holochila — Non-flowering plants were seen in several localities all within a few kilometres of the coast. Although no flowering material was collected, the author is certain of the identification of this species. It always occurred in large colonies in eucalypt dominated forest. It is presumed that the flowering period is very early in the wet season. This collection represents a new record for Iron Range.

Nervilia plicata — This species is better known in Australia as *N. discolor* (for details of the name change see Seidenfaden 1978). As with *N. holochila* no fertile material was seen but the leaf is distinctive for this species. It was seen in similar habitats to the other *Nervilia* species. A previous collection was made by Brass in 1948 at Iron Range.

Nervilia sp. — Infertile specimens were collected of one, or possibly two, species of *Nervilia* near Iron Range Airport. It is possible that either or both *N. uniflora* (F.

Liparis habenaria
Iron Range
Photo: M. Hodge

Malaxis marsupichila
at Garraway Creek, Feb. 1980
Photo: P. Lavarack

Dendrobium lobbii
at Tozer's Gap swamp
Photo: M. Hodge

Muell) Schltr. and *N. crociformis* (Zoll. & Mor.) Seidenf.* may be represented among these species as there did appear to be two species present. Only flowering material will resolve this question. Whatever the identity, these leaves represent species previously unrecorded for Cape York Peninsula.

Liparis habenarina — Plants were seen in two or three localities, all a few kilometres from the coast. Only one fertile specimen was collected. This species was found growing in dense grass in eucalypt-dominated forest. The species was previously collected by Brass in 1948.

Malaxis marsupichila — Flowering plants of this species were abundant in a rather dry rainforest on a rocky slope to the west of Tozer's Gap. The plants were most common near the margin of the forest and grew in leaf litter. This species was previously recorded at Bamaga and the Rocky River. It is a new record for the Iron Range area.

Geodorum densiflorum — Flowering plants of this species were seen in a wide variety of habitats, ranging from very open *Melaleuca* forest to dense rainforest. This species had previously been recorded at Iron Range (Lavarack 1977b) and the flowering material now available confirmed this identification.

Spathoglottis sp. — Plants of this unknown species were seen at Tozer's Gap. No flowering material was seen.

Bromheadia venusta — Good flowering material of this species was obtained near Tozer's Gap. It was first collected in this area by Brass in 1948.

Dendrobium lobbii — This species was observed in flower at Tozer's Gap. It, like the previous species, was first collected by Brass at Brown Creek in 1948.

DISCUSSION

Several new records for Iron Range and extensions of range of species to Cape York Peninsula were recorded on this expedition. No 'new' species were collected, although further collections of the unknown *Nervilia* and the *Calochilus* sp. could prove interesting in this regard.

A more balanced record of the orchids of the area was obtained than was previously available. It is interesting that the wet season orchid flora appears not significantly different to that of the Darwin area. These orchids are part of the moister phase of the widespread tropical flora which extends from the Kimberleys to the top end of the Northern Territory and Cape York Peninsula. This flora would exclude plants of the rainforests and swamps such as *Bromheadia, Spathoglottis* and *Dendrobium lobbii,* which may be recent arrivals from New Guinea.

There are equally strong relationships with the wet season orchid flora of the humid tropics between Ingham and Cooktown, although certain genera such as *Habenaria* are better developed there. Other genera such as *Didymoplexus* and *Prasophyllum,* which occur as wet season terrestrials in the south, have not been found at Iron Range, although this could be because they are readily overlooked.

The discovery of only two species of *Habenaria,* and then of only four individual flowering specimens, was a disappointment. There is a strong possiblity that this paucity of plants may have been related to the late arrival of the wet season in this year. Although substantial rain had fallen in late December and January, the areas visited showed very little evidence of this. While this poor, wet season may have resulted in a decreased flowering, it did allow visits to several areas which would have otherwise been inaccessible.

The list of terrestrial orchids found on this expedition is a minimum and basic one for the region. It is probable that in better years or perhaps in pockets overlooked on this occasion, other species will be found.

ACKNOWLEDGEMENTS:

The members of the party would like to thank Doug and Barb Holdsworth and Wally Betts for their hard work, hospitality and enjoyable company on this trip. Thanks are also due to Ross and Nita Pope of Portland Roads for their hospitality and for the use of their boat. The author is also indebted to the Directors of the Australian Orchid Foundation, to Gerald McCraith in particular, for the financial support of this study; to Len Lawler for much of the organising; and to Gerald, Len, John Clarkson and Merv Hodge for their enthusiasm and pleasant company on this trip.

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May, 1980

Queensland National Parks & Wildlife Service

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* *N. crociformis* is better known under the synonym of *N. crispata* (Fl.) Schltr.

Three New Species of Dendrobium Section Ceratobium from Papua New Guinea

by P.J. Cribb

Few cultivated orchids are less well studied taxonomically than are the species of *Dendrobium* sect. *Ceratobium.* Many of these are highly ornamental, having many large and attractively coloured flowers. A number of the species have been introduced into cultivation, particularly in recent years, and several have also been used as parents in hybridisation programmes. However, some species, which are now quite frequently found in cultivation and have even been used in hybridisation, have yet to be named and described. Three such species are named and described here for the first time. The first two, *D. helix* and *D. tangerinum,* are among the most frequently grown *Ceratobium* species, whilst the third, *D. crispilinguum,* has attractively coloured flowers, which may well lead to its being used as a parent in the future. It is hoped that this paper will be the prelude to further work leading to a revision of this poorly understood, but popular group.

Dendrobium helix Cribb sp. nov. affine *D. discolore* R.Br. sed columnae stelidibus acutis, petalis spiralitertortis marginibus noncrispatis, labelli lobo medio plano reflexis, callis apice non elevatis satis differt. Typus: New Britain, H. Slade s.n. (K, holotypus!) *

A large erect epiphytic **herb. Pseudobulbs** clustered, up to 1m tall, canelike, swollen at base to 1.7cm diameter, tapering slightly above, yellow-orange when dry roots clustered at base. **Leaves** coriaceous, spreading, elliptic or ovate elliptic, obtuse and minutely bilobed at apex, up to 16 x 6.5cm but smaller towards the apex, articulated to a tubular scarious sheathing base up to 3cm long. **Inflorescences** one to several erect-ascending, up to 50cm long, laxly many-flowered, emerging through the bases of the upper leaf sheaths; **bracts** ovate, acute, 4mm long. **Flowers** yellow or ochre heavily speckled with maroon-brown with a mauve or pink central zone on lip and a white or pink column. **Dorsal sepal** spirally recurved, oblong-oblanceolate, obtuse, 3 x 0.8cm, with undulate margins; **lateral sepals** recurved-inrolled, oblong, obtuse, 2.6 x 1–1.2cm. **Petals** erect to suberect-spreading, spirally twisted three or four times, oblanceolate, rounded at apex, 3–4.5 x 0.7–1cm. Lip three-lobed, 2 x 1.1cm; mid-lobe recurved, oblong, apiculate; side lobes erect rounded and spreading in front; callus of three low longitudinal ridges from base but tapering out on middle of mid-lobe. Column short 4mm long with 2 ventral apical acute stelidia; foot 1cm long; anther bilobed at base, papillose in front.

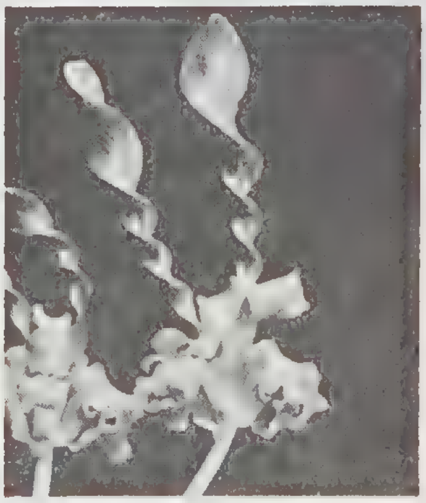
Distribution: New Britain, only epiphytic on exposed branches of lowland forest trees; sea level.

New Britain: Pomio subdistrict, fl. in cult. 14 Dec. 1977, H. Slade s.n.!; East New Britain District: Pomio subdistrict, Schirlitz Peninsula, S. facing beach, Fulleborn H., 12 May 1973, J.R. Croft & P. Katik in NGF 15539!; West New Britain: Kandrian subdistrict, Cape Roebuck E. of Fulleborn Harbour, 9 May 1973, J.S. Womersley in LAE 55349! without exact locality, cult. Goroka P.N.G., 30 Dec. 1963, Chadim 27!

Dendrobium helix is readily recognised by its ascending spiral oblanceolate petals which may be twisted three or four times, by its column with acute stelidia and by its lip which bears three prominent but low longitudinal ridges. Its flowers are among the largest in the section and it occurs in a variety of forms with brown being the predominent colour. Apparently confined to the island of New Britain, east of New Guinea, it is already widely cultivated and has been frequently used as a parent in hybridisation under the name *Dendrobium* 'Pomio Brown' and other similar names.

It is allied to *D. discolor* R.Br. from Australia and New Guinea but is readily distinguished by its larger lip in which the mid-lobe can be readily flattened, its petals which have smooth, not crisped, margins and by its column which bears acute stelidia. *D. cochliodes* Schltr. from New Guinea is probably also closely allied but that species also lacks acute stelidia and has linear red-brown petals.

Plants cultivated under the names *Dendrobium* 'Talasea Mushroom Pink', *D.* 'Talasea Lime Yellow', etc. also originate from New Britain and are very closely allied to *D. helix.* As yet, I have not seen adequate material to convince me of the true status of these clones. However, I cannot distinguish flowers of *D. helix* and *D.* 'Talasea Lime Yellow' taken from herbarium or picked specimens. At present, I am inclined to the view that *D.* 'Talasea' may not be specifically distinct from *D. helix* but may merit infraspecific rank within *D. helix.* It certainly differs less from *D. helix* than do the many forms of *D. gouldii* from each other (Hunt, 1970).



Dendrobium helix Cribb
from the Pomio subdistrict, New Britain Photo: T. Reeve

Dendrobium tangerinum Cribb sp. nov. affine *D. strepsiceros* J.J.Sm sed columnae apice denticulato, mento breviore, lobo medio minore labelli lobis lateralibus erectis nec patentibus distinguendum. Typus: New Guinea, Chadim CH 176 (K, holotypus!)

An epiphytic **herb. Pseudobulbs** clustered, canelike erect, slightly swollen below, to 50cm or more long, leafbearing in apical half. **Leaves** coriaceous, oblong or oblong-elliptic obtuse, 9 x 2.5cm, articulated below to coriaceous tubular sheathing base up to 3cm long. **Inflorescences** one to several, spreading to erect, to 35cm long, laxly to about 15-flowered, emerging through leaf sheaths of upper leaves; **bracts** linear-lanceolate, acuminate, 5–8mm long. **Flowers** orange-yellow with maroon venation on sepals and lilac keels on lip which has a white base; **pedicel** and **ovary** 2.6–3cm long. **Dorsal sepal** recurved-inrolled, oblong; obtuse, 2.3–2.5 x 0.6–0.7cm, with undulate margins; **lateral sepals** recurved-inrolled in apical half, falcate, oblong-ovate, obtuse or slightly apiculate, 1.6–2.3 x 1–1.2cm. **Petals** erect, spirally twisted two or three times, linear oblanceolate, obtuse, 3.3–4 x 0.4–0.5cm. Lip three-lobed, elliptic in outline, 1.8–2.2 x 1.1–1.6cm; mid-lobe recurved, elliptic, acute; side-lobes erect, rounded in front, with erose margins; callus of three or five low verruculose ridges ending on base of mid-lobe. Column 5–7mm long, denticulate or erose on apical margin, papillose on ventral margins.

Distribution: New Guinea, exact locality data lacking.

Papua-New Guinea: without exact locality, Chadim CH 176! & Searle 4!; Morobe District: Kaiapit, NW. of Lae, cult. Kew 3 Aug. 1978, Millar s.n.!

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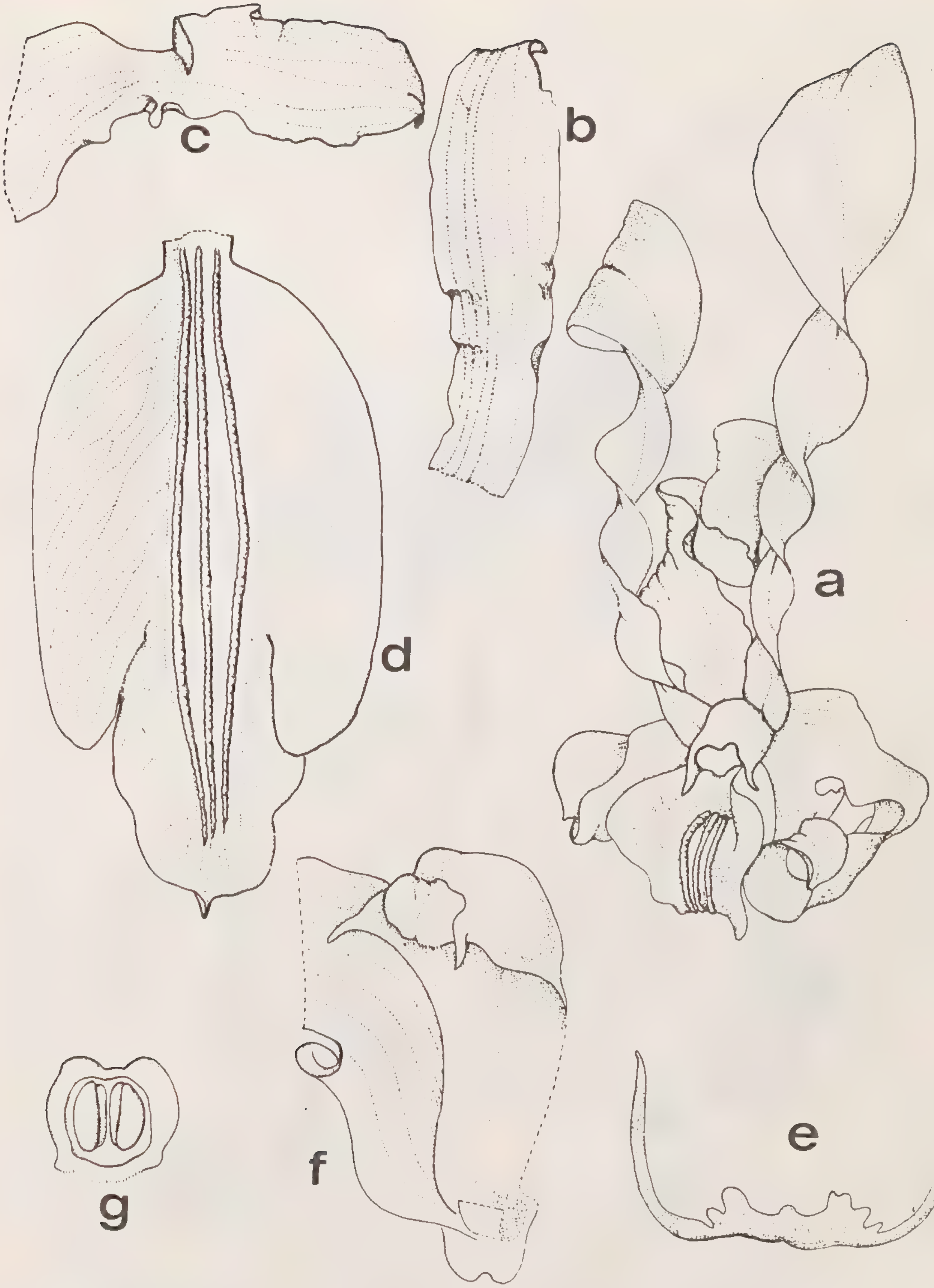
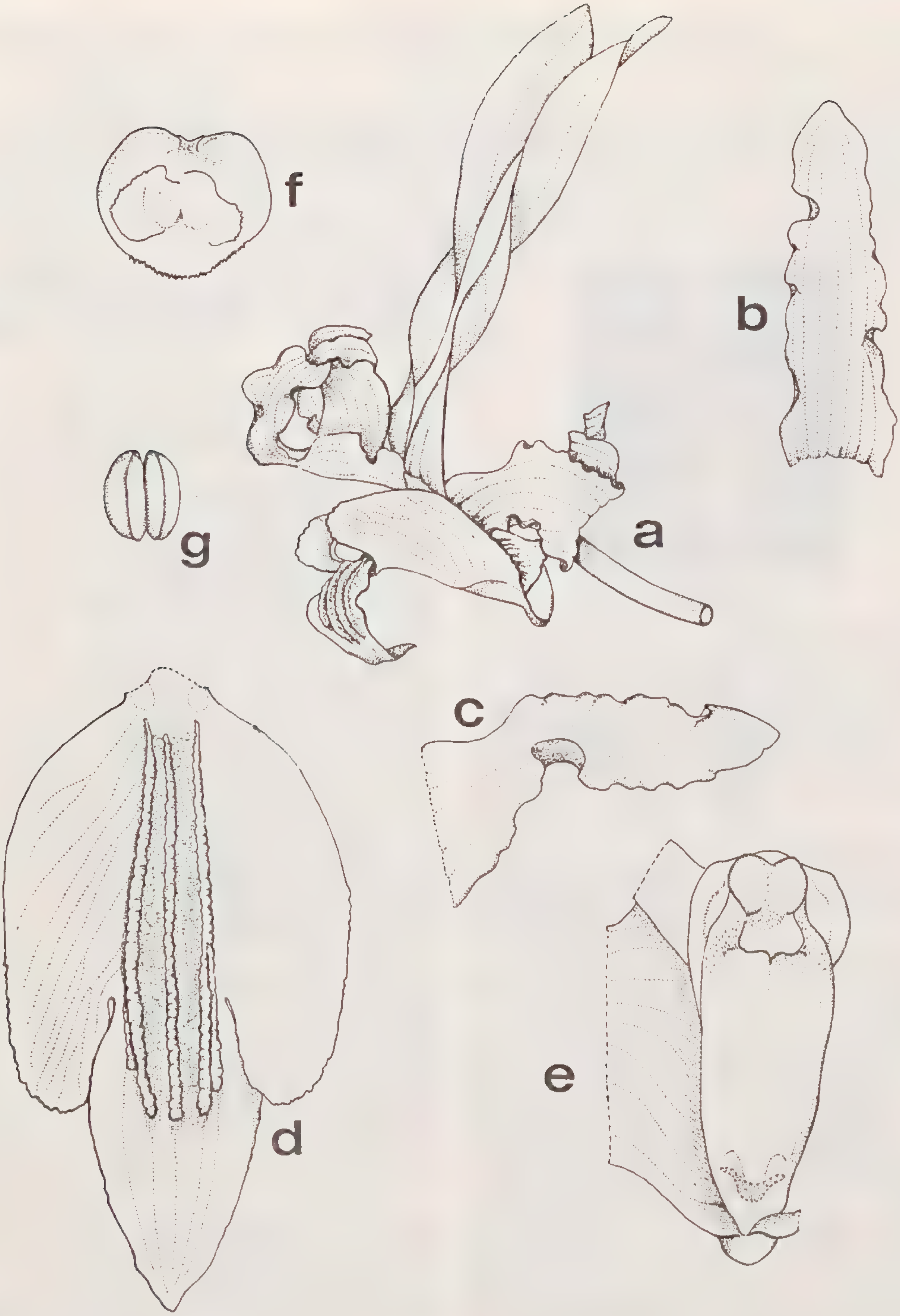
* The exclamation mark (!) in this article is a symbol indicating that the matter referred to has been examined by the author.



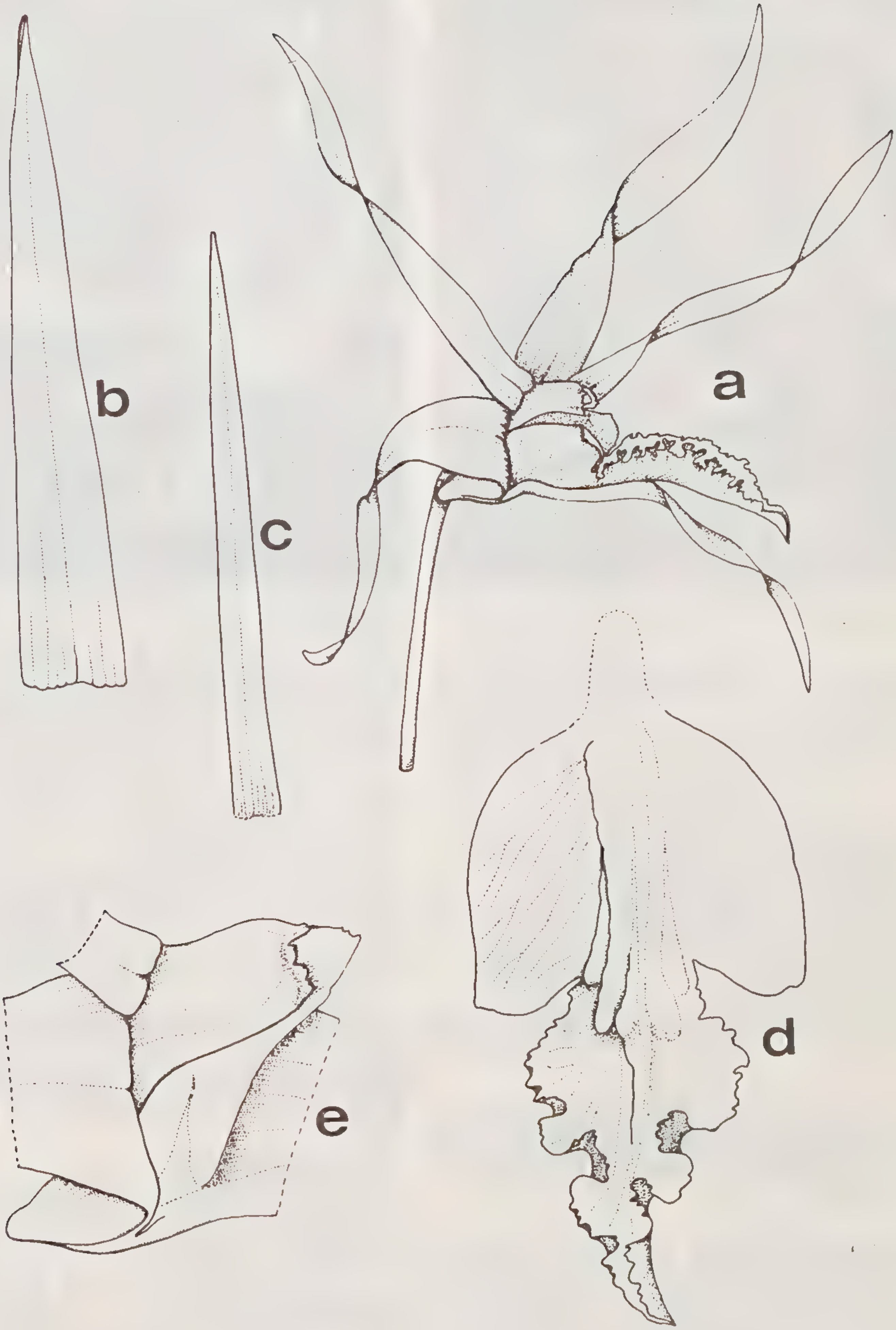
Dendrobium helix Cribb
a flower from front
b dorsal sepal
c lateral sepal
d labellum flattened
e section through labellum
f column and column foot
g anther

Drawing: Mair Swann



Dendrobium tangerinum Cribb
a flower from side
(lateral sepal removed)
b dorsal sepal
c lateral sepal
d labellum flattened
e column and column foot
f anther cap
g pollinia

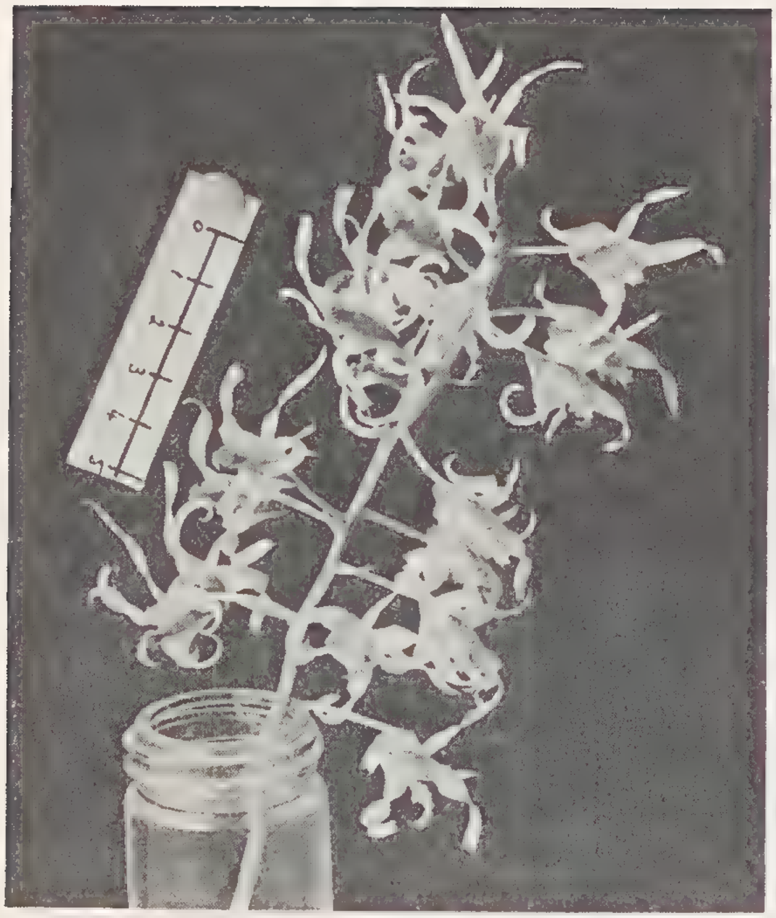
Drawing: Mair Swann



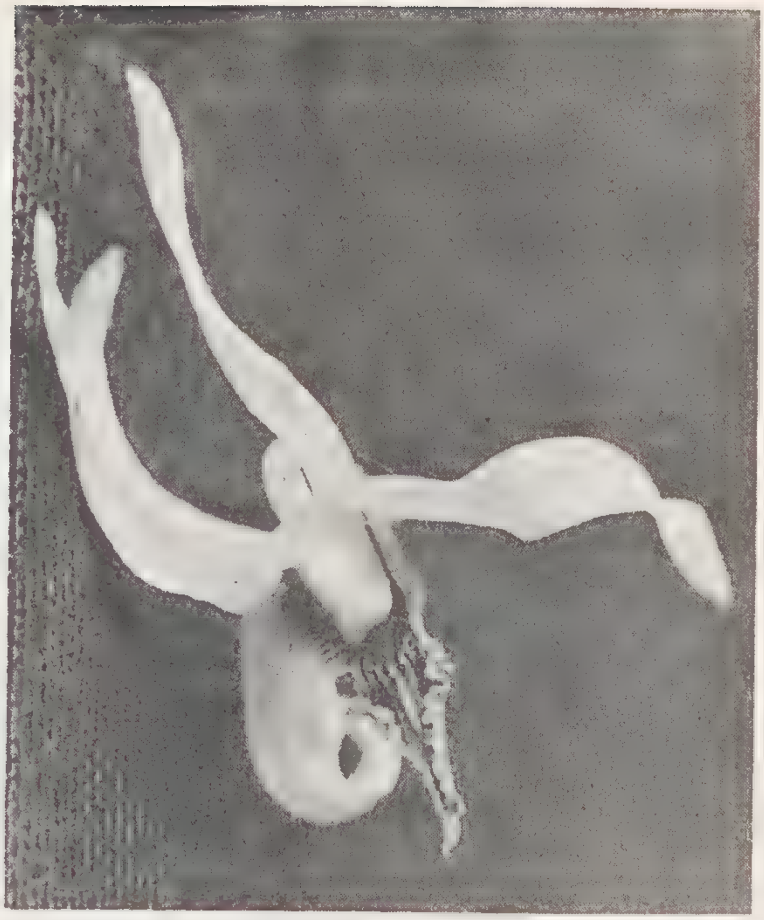
Dendrobium crispilinguum Cribb from Morobe and Eastern Highlands Districts of Papua New Guinea

a flower
b dorsal sepal
c petal
d labellum
e column and mentum

Drawing: Mair Swann



Dendrobium crispilinguum Cribb
Photo: T.M. Reeve



D. crispilinguum Close-up of flower and crispate labellum
Photo: T.M. Reeve

Like *D. helix,* this species is already well known in cultivation where its tangerine-orange flowers have made it a popular parent for crossing. *D. tangerinum* was first introduced into cultivation probably in the last war (Millar, 1966). By the mid-1960's several attempts had been made to name this species which were summarised by Hawkes (1967). He justifiably did not agree with its tentative identification at the Oakes Ames Herbarium as *D. stebloceras* Rchb.f. for this is a quite distinct Moluccan species. However, *D. tangerinum* is more closely allied to *D. strebsiceros* J.J.Sm. which leads me to suspect that a typing error may have resulted in the Ames determination.

D. tangerinum differs from *D. strepsiceros* in having a lip with erect non-spreading side-lobes and a smaller mid-lobe lacking a central raised callus towards its apex. It also has a denticulate apex to the column and a shorter pedicel and mentum.

Colour illustrations of *D. tangerinum* may be found in Jones & Scully Inc. Orchidglade Catalogue for 1967/8 and in Millar (1978). In the latter it appears erroneously as *D. strebloceras.*

Dendrobium crispilinguum Cribb sp. nov. affine *D. mirbeliano* Gaudich. sed foliis angustioribus acutis, floribus cremeis labello lilacino, petalis angustis tortilibus et lobi medii labelli marginibus crispato-undulatis satis differt. Typus: Papua New Guinea, Arona, Millar in NGF 15917 (K, holotypus!)

An erect epiphytic **herb** to 1.70m tall. **Pseudobulbs** clustered, canelike to 1m tall, 1cm diameter, swollen and oblique at base, leafy in apical part, orange when dry. **Leaves** about 9, coriaceous, suberect, ovate-lanceolate or lanceolate, acute, up to 12 x 1.5–3.5cm but smaller towards apex, attached below dehiscence layer to a slightly inflated tubular sheath up to 4cm long. **Inflorescences** suberect or spreading, emerging through base of upper leaf sheaths, to 40cm long, up to 20-flowered; **bracts** lanceolate, acuminate, 6–8mm long. **Flowers** creamy or yellowish with a white lip heavily suffused and veined with lilac-purple; **pedicel** and **ovary** 2.6–3cm long, ovary borne at obtuse angle to pedicel. **Dorsal sepal** recurved and slightly twisted 180°, lanceolate, acute, 2.6–3 x 0.4cm, undulate; **lateral sepals** falcate, reflexed, lanceolate, acute, 2.6 x 0.7cm. **Petals** once or twice twisted, suberect, linear, acute, 2.5–3.3 x 0.2cm. Lip 3-lobed in middle, oblong in outline, 1.8 x 1cm; mid-lobe not recurved, ovate-lanceolate, acute, 1.1 x 0.6cm, margins undulate-crispate; side-lobes oblong, truncate, with erose front margin; callus of five ridges, central one longest on to base of mid-lobe, all ridges slightly laminate at apex. Column 5mm long, with erose-denticulate apex; foot 5–6mm long.

Distribution: Morobe & E. Highlands Districts of Papua New Guinea; epiphyte in rain forests; 1100–1450m.

Papua New Guinea: Morobe District: Mumeng subdistrict, Wagau, 22 Nov. 1967, Millar & Dockrill in NGF 12070!; E. Highlands District: Kainantu subdistrict, Arona, 28 Aug. 1963, Millar in NGF 15917!; without exact locality, Chadim CH 4!

D. crispilinguum is an attractive but relatively small flowered species from north east New Guinea. It is superficially not unlike *D. mirbelianum* Gaud. in that the lip mid-lobe is not reflexed. However, it can be readily distinguished by its narrower acute leaves, its more twisted, narrower petals and by the crisped undulate mid-lobe of the lip.

ACKNOWLEDGEMENTS:

I would like to thank Mr Hermon Slade and Mr Geoff Elworthy for their encouragement during the preparation of this article and for providing living and preserved material of *D. helix* and to Mr Tom Reeve for providing the photographs of *D. crispilinguum* and *D. helix.*

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**The Herbarium,
Royal Botanic Gardens, Kew,
Richmond, Surrey, England**

Received March, 1980

Native Orchids of New Zealand — Epiphytes

8 — *Drymoanthus* Nicholls

by Dorothy Cooper

Drymoanthus adversus (Hook.f.)

This is one of New Zealand's smaller epiphytic orchids, which, like the Earinas and *Dendrobium cunninghamii,* is evergreen and perennial. It grows on several different host trees and shrubs — usually fairly smooth barked specimens — and also on rocks. It is often associated with an encrusting lichen. Early botanists described it as growing high on trees in well lighted places, but the dozens of specimens I have found have all been relatively low on trees or on rocks, often in fairly dark shaded situations. It does require ample moisture, however, and soon shrivels if kept too dry. The flattish roots stick well and as they spread widely are easily damaged by removal. They are a pale, grey colour, often turning green in wetter situations.

Plants have a very short stem, only 5cm or so high with very little space on the stem between the alternate leathery leaves, which are arranged more or less in one plane and break off, when older, across a neat line. Up to 6 or 8 leaves occur on a specimen at any one time. They are often marked red-purple beneath and grow up to 6cm long by 1.5cm wide. The plant seems to grow extremely slowly, a new leaf forming at the top. Roots are proportionately very long, while the tiny flowers, which are formed on a short hanging raceme which develops among or below the leaves, develop into very large capsules for the size of the flower.

The greenish flowers are marked on the outer surface with red-purple and each has a small purplish bract. The individual flower stalks are green, while the main flowering stem is purple. More than one raceme may occur on the same plant, old stalks persisting for several years, as in *Earina autumnalis.* There may be 12 or 15 flowers on a raceme but there are usually fewer. The petals are slightly smaller than the sepals.

The cup-shaped labellum is thick and fleshy with a deep hollow centre. There are lateral lobes projecting from the inner sides of the cup, a feature which seems to distinguish it readily from *D. minutus* Nicholls (see Dockrill *Australian Indigenous Orchids* pp. 797-9). It is similar to members of the genus *Sarcochilus* in Australia and was in fact called *Sarcochilus adversus* by J.D. Hooker. Nicholls distinguishes it as having an entire labellum (there is actually a tiny central lobe), being sessile at the immediate base of the column with no glands or callosities on the disc of the labellum. Hatch (1948) refers to the lateral projections in the lip as greenish calli. The labellum is sometimes uppermost, and although the 'midlobe' is always small, it does vary in size.

The short column has a deep stigma, a large sticky disc at the base of the caudicle of the pollinia and a cream anther that withers and curls back shortly after the flower opens. Lateral column wings extend around the front of the column above the stigma.

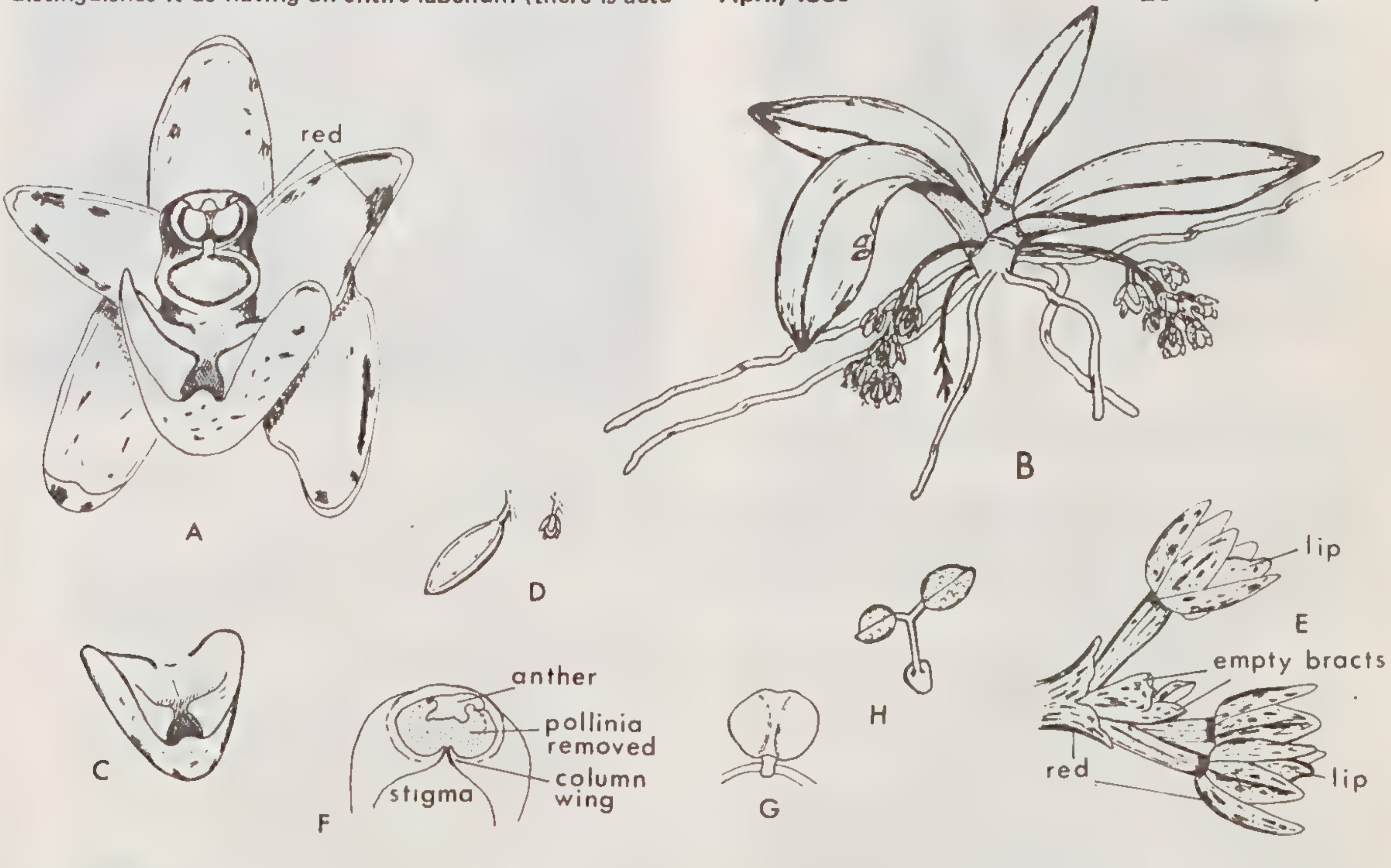
The four pale yellow pollinia are in two pairs. Within each pair the sizes are quite uneven, but the main feature is that, when removed, the whole structure lifts off in one piece and as the disc is very sticky, it would be easily removed by an insect. The flowers are presumably pollinated by tiny insects or mites as they are slightly fragrant and there is sometimes nectar between the base of the column and the labellum. The position of the pollinia and the stigma is also suited to insect pollination.

The large capsules are very prominent and long lasting. Each capsule contains densely curled 'woolly' hairs with its seeds, perhaps aiding in the ejection of the seed when the capsule splits.

Drymoanthus adversus flowers from September to December and occurs throughout New Zealand.

April, 1980

14 Avalon Crescent
LOWER HUTT, N.Z.



Drymoanthus adversus
A Enlarged flower
B Flowering specimen, natural size
C Labellum
D Relative size of capsule and flower
E Tip of flowering raceme
F Showing column wings
G Anther on newly opened flower
H Pollinia

CALADENIA CATENATA (Sm.) Druce
A Taxonomic Note

by D.F. Blaxell

The type specimen of this species was collected by Surgeon-General White at Port Jackson about 1795 and despatched to J.E. Smith (the founder of the Linnean Society of London), together with specimens of other common plants of the Sydney region. The plant was illustrated in Smith's book, *Exotic Botany*, in 1804 but the drawing was somewhat aberrant for a *Caladenia*, so has been dismissed as an abnormal form of something (see Rupp's 1947 paper in the Proc. Linn. Soc., N.S.W.). However, the specimen is still housed in the Smith herbarium in the Linnean Society of London and is a perfectly "normal" *Caladenia carnea* (and *alba*).

Smith's use of the name *Arethusa catenata* reflected the thinking of the time with a much wider inclusion of species from the "new" lands in genera which were known from the Americas. The genus *Arethusa* still applies in the New World.

Robert Brown in 1810 first published the genus *Caladenia* and described both *C. carnea* and *C. alba*. He must have seen Smith's specimen of *Arethusa catenata*, but strangely makes no reference to it. All subsequent Australian botanists have continued to use Brown's two names for this species, except George Bentham who, in his *Flora Australiensis* reduced *C. alba* to a variety of *C. carnea*.

I examined Smith's specimen, on which the name *Arethusa catenata* is based, in 1975 and concluded that it was *"C. carnea"*. Since *"catenata"* is the older epithet it must take precedence over *"carnea"*. This Druce pointed out in 1916, but was ignored by all until Hallé revised the orchids of New Caledonia in 1977.

Hallé also considered *C. alba* to be synonymous with *C. carnea* and *C. catenata*. Having examined Brown's types of *C. carnea* and *C. alba* I agree, since they differ only in colour(not obvious from the specimens, but mentioned by Brown in his text), and in other minor ways. However, I believe that this group of orchids needs to be studied in more detail on an Australia-wide basis. In the meantime, there is now a trend towards using *C. catenata* for the *C. carnea — alba* complex. In fact Dr Curtis, in her just-published *Student's Flora of Tasmania*, * uses *C. catenata* with *C. carnea* as a synonym and makes the new combinations required for var. *minor*, var. *exigua* and var. *gigantea*.

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* Reviewed in the present issue of *The Orchadian* at p. 181

May, 1980

The National Herbarium of N.S.W.
Royal Botanic Gardens, Sydney

Caladenia catenata (Sm.) Druce
(The pink form known as *C. carnea*) x 1 Photo: G. Wells

Caladenia catenata
(The white form known as *C. alba*) x 1 Photo: P. Collin

NOTICES

ANOS ANNUAL GENERAL MEETING AND ELECTION OF COUNCIL FOR 1980-1981

NOTICE is hereby given that the Annual General Meeting of the Australasian Native Orchid Society will be held on Saturday, 9 AUGUST, 1980 at the Ryde School of Horticulture, 59 Parkes Street, West Ryde, at 10 a.m.

Business of the meeting: —

1. President's report.
2. Adoption of the Financial Statements and the Auditor's Report thereon.
3. Election of Office Bearers.
4. Any other business that may be properly brought before the meeting.

Closing date for nomination of candidates for election to Council is Monday, 4 AUGUST, 1980 at 4 p.m. The method of voting shall be by a show of hands and by signed proxy at the A.G.M. Proxies must be as prescribed in Section 53 of the Constitution and must reach the Secretary not less than 48 hours before the meeting.

By order of the Council,

D. de Silva
Secretary

ANOS JUDGES

To the initial list of the seven successful candidates at the first ANOS Training Course for Judges, as published in *The Orchadian* of December, 1978 (p.34), the Registrar has added the name of IAN SLADE.

On a recommendation of the Registrar on 27 February, 1980, ANOS Council has approved the appointment of the following successful examinees as Associate Judges: —

J. Bruhl
R. Rivett
I. Slade
G. Wells

This brings the number of Associate Judges to a total of eight.

BOOK REVIEWS

THE STUDENT'S FLORA OF TASMANIA — Part 4A Angiospermae:Orchidaceae, by Winifred M. Curtis, D.Sc. (Lond.), F.L.S. 138 pp. Government Printer, Tasmania, 1979. 25cm x 16cm, stiff cardboard cover, printed on matt white paper. Available from Government Printer, G.P.O. Box 307c, Hobart 7001, Tasmania. Price: $14.00 bound ¼ flush and $17.10 bound full cloth boards.

This book provides dichotomous keys for the identification of Tasmanian orchid genera and species, quite detailed morphological descriptions of each genus and species, synonyms of each species, brief notes on habitat, distribution and flowering times, 27 line drawings and nine pages of colour photographs. In addition, there is a glossary of botanical terms used for Orchidaceae and a general morphological description of the family.

The keys seem to be easy to use: obvious morphological differences are cited whenever possible. The detailed descriptions, although lacking many measurements (e.g. leaf length), provide a sound basis on which to check key identifications. The beautifully executed line drawings by D.I. Morris apparently are included to illustrate the diversity of forms within genera, although some (e.g. the illustration of column types in *Thelymitra*) are necessary aids in identification, because of the difficulty in describing subtle morphological differences. The notes on distribution, habitat and flowering time are not very specific, but are adequate for a work of this type, where space is a limiting factor. The colour plates are of variable quality due generally to the poor reproduction rather than poor photography. There is a lack of trueness of colour and sometimes considerable spotting.

Three new infra-specific combinations are made, and one new species described in an appendix — "Notes on Nomenclature". * It is a pity that these name changes were not published in a botanical journal prior to publication of the *Flora,* as they could then have been discussed in more detail. Furthermore, it seems unfortunate to clutter unnecessarily an otherwise well produced book.

Interestingly, Curtis follows Hooker in including *Townsonia viridis* in the genus *Acianthus*; but, alas, no explanation for this decision is given.

In general, this book is well set out, and is a great improvement on its predecessor, M.J. Firth's *Native Orchids of Tasmania.* The above criticisms do not detract from its usefulness as an aid to orchid identification in Tasmania.

PETER WESTON
12 Mary Street
April, 1980 **LONGUEVILLE, NSW 2066**

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* See p. 180 (this issue) for Mr D.F. Blaxell's taxonomic discussion of *Caladenia catenata.*

General editorial comment:

As both, Peter Weston (above) and Alex S. George (in the "Australian Systematic Botany Society Newsletter No. 22" of March, 1980 page 12), have said: the book is a great improvement on "Native Orchids of Tasmania" by M.J. Firth.

Of particular significance to readers of *The Orchadian* however, are the following features: —

a) Nomenclature changes by Dr Curtis
Caladenia carnea R.Br. becomes *Caladenia catenata* (Sm.) Druce
C. minor Hook.f. becomes *C. catenata* var. *minor* (Hook.F.) W.M. Curtis
C. exigua Cheeseman becomes *C. catenata* var. *exigua* (Cheeseman) W.M. Curtis
C. carnea var. *gigantea* R.S. Rogers becomes *C. catenata* var. *gigantea* (R.S. Rogers) W.M. Curtis

b) A new species has been named and described (pp. 107 and 133) as *Caladenia pusilla* W.M. Curtis which probably includes *C. carnea* var. *pygmaea* R.S. Rogers. (The *C. catenata* complex, says Dr Curtis, requires further study.)

c) Dr Curtis "sinks" *Pterostylis oreophila* S.C. Clemesha along with *P. vereenae* R.S. Rogers into the one species *P. dubia* R.Br. However, she does not refer to Clemesha's description in *The Orchadian* of October, 1974, Vol. 4, No. 11, p. 100, of *P. oreophila* as a new species. Readers may find it interesting to compare the drawing in Clemesha's article (p. 101 *Orchadian* Vol. 4) with the drawing in Curtis's book of *P. alpina* (p. 18), (which Clemesha regards as the closest relative to his *P. oreophila*). There is also a good colour photograph (Plate 3) of *P. dubia.* Dr Curtis suggests that "at the lower limits of its altitudinal range *P. dubia* may hybridize with *P. alpina*" (p. 16). — Editor

ORCHIDS OF INDIA by T.K. Bose and S.K. Bhattacharjee Calcutta, Jan. 1980; 538 pp., 47 colour, 15 b.&w. photographs, 317 line drawings. Price: Rup. 550, about $Aus. 63.

The publishers sent me a copy of this book on credit; in fact, in response to my enquiry as to whether it was actually in print. In general, I am greatly disappointed with its quality, accuracy and general value as a text and for the sake of others considering its purchase I would like to bring to notice some of the defects that came to light during a brief look through it. This is far from being an exhaustive review.

Firstly, the quality of printing and colour reproduction is well below that of other comparable publications in this price range.

Secondly, this could be accepted if the text were authoritative, accurate and informative, which it certainly is not. Let me cite a few of the more glaring examples: —

a) many species have been entered *twice* — in two different genera. For example, *Pleione hookeriana, P. humilis* and *P. praecox* are also entered as *Coelogyne* species. This has also been done in the genera *Cymbidium/Cyperorchis, Sarcochilus/Chiloschista* and *Dendrobium/Epigeneium;*

b) recent taxonomic revisions have evidently not been taken into account. For example those of *Papilionanthe* and *Esmeralda;*

c) ranges for some given genera and species are inaccurate. *Appendicula* does not occur in Australia; *Doritis pulcherrima* has not previously been recorded from India and there is no indication that this entry is a new record. Burma is the nearest known locality;

d) a couple of colour photographs are wrongly identified — that of *Paphiopedilum villosum* is called *P. spicerianum;* the picture masquerading as *Renanthera imshootiana* is actually of an *Epidendrum* species or hybrid of this South American genus.

Thirdly, many of the line drawings are upside down or side on; for example *Diplomeris, Coelogyne cristata, Diploprora, Ornitharium, Ornithochilus,* and others.

Fourthly, there are no citations of original descriptions, other treatments or synonymy of the taxa.

Lastly, the content of the nine lead-up chapters on morphology, biology, cultivation, propagation etc. (48 pp. in all, or about 8% of the text) appears to offer little by way of new material and is mostly readily available elsewhere.

Indeed, one can find very little in this book to be enthusiastic about. Perhaps the binding is of fair quality. The whole thing gives the impression of having been composed in great haste and, in the light of the failure or great tardiness of one of their compatriot writers * to complete a work on the same topic, it is difficult for one to escape the conclusion that this is a somewhat cynical attempt to "scoop the market". More is the shame as there is still no reliable, modern account of this extensive, diverse and very interesting orchid flora.

B.J. WALLACE
Botany Dept., University of New England
12 April, 1980 **ARMIDALE, NSW 2351**

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* The reference is to Udai C. Pradhan, *Indian Orchids : Guide to Identification and Culture,* Vol. 1 was published in 1976. Vol. 2 has not yet appeared, even though it was advertised in 1975 as due for publication in December, 1975! Those who paid for both volumes in 1975 have had a long wait. — Editor

ANOTHER LOOK AT *PTEROSTYLIS BARBATA* LINDL. and *PTEROSTYLIS PLUMOSA* CADY in WESTERN AUSTRALIA

by Andrew Brown

The article on *Pterostylis barbata* Lindl. and *P. plumosa* Cady by Peter Vaughan in the December, 1979 issue of *The Orchadian* prompted me to write this follow-up article on my personal observations of the two species in Western Australia.

P. barbata which, in Western Australia, is almost always found growing under or near *Casuarina* (Sheoak), is far more widespread than many realize. Although undoubtedly at its best in the Darling Range near Perth and south to Albany, *P. barbata* can also be found as far north as Geraldton and east almost to Esperance with scattered appearances throughout the wheatbelt where it is widespread, but uncommon. In the latter area it is often found near the base of granite outcrops where extra moisture due to run off is present.

P. barbata can be found flowering from mid-July to late October, flowering first in the north and east, then progressively later as you travel south.

The second Western Australian species, said to be very similar to *P. plumosa* (A.S. George, *Nuytsia* Vol. 1, No. 2, 1971) generally flowers later than *barbata*, from mid-October to late November.

Having seen specimens of *P. plumosa* from the eastern States, I am not convinced that ours is the same species. The Western Australian form appears to be roughly intermediate, resembling *P. barbata*, but differing in its lighter colouring, densely hairy labellum, later flowering period and generally different range of distribution.

It is possible that we may have either one variable species or perhaps three different species. It is clear from recent discussion with Mr Alex George that further research is necessary to determine this.

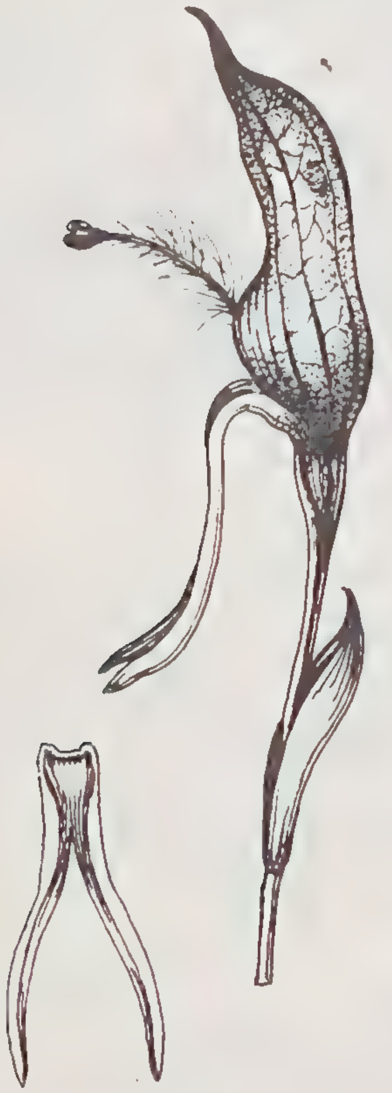
Unlike *P. barbata, P. plumosa* is not confined to *Casuarina* thickets and appears equally at home under a wide variety of conditions ranging from low scrub near swamps to thick Jarrah and Karri forest. To the east of Esperance it is quite at home in swampy ground.

In regard to distribution, *P. plumosa* can be found roughly south-west of a line drawn from Albany to Mt. Barker then across to Busselton; however, it also occurs in the Esperance area, where it has an earlier flowering period (August and September). The coastal area between Esperance and Albany is largely unexplored and therefore it is quite possible that *P. plumosa* also occurs between the two. Although distribution boundaries of the two species often overlap, they usually flower at different times. Exceptions, however, do occur, for near Busselton both can be found growing in conjunction with a number of intermediate forms. In fact the apparent hybrids are more numerous than either of the parents. Nevertheless, I have seen *P. barbata* and *P. plumosa* growing together at several other locations without any hybrid forms in evidence.

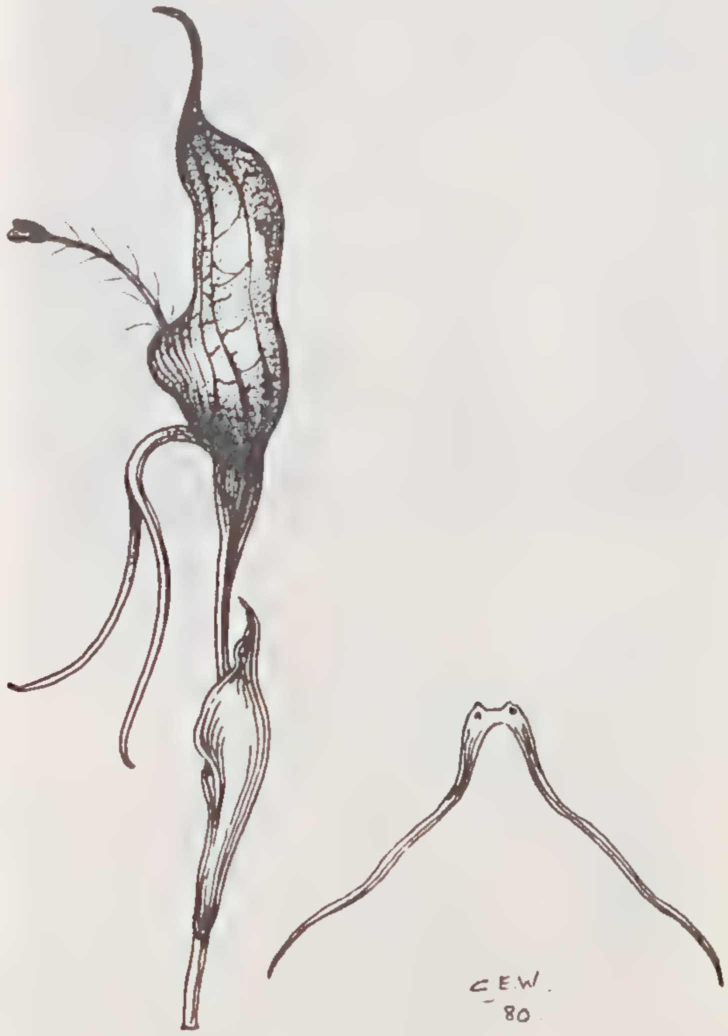
Finally I would like to do further study into the two species and perhaps find out if the same pollinating agent is visiting both in the Busselton area.

24 April, 1980

131 Langford Avenue
LANGFORD, W.A. 6155



Pterostylis plumosa
and lateral sepals



P. barbata
and lateral sepals

Drawing:
C.E. Woolcock

LETTERS TO THE EDITOR

On the Status of Caladenia hastata

Dear Sir,

I should like to add a comment to those made by Mr D.F. Blaxell (*The Orchadian* March, 1980) on the status of *Caladenia hastata* as a species.

In an article entitled "Alterations and Additions to the Vascular Flora of Victoria – Part 2" (Vol. 95, No. 5, p. 199 – Sept./Oct. 1978), A.C. Beauglehole listed *C. hastata* as a species. This taxonomic nomenclature has been retained in the official Flora Species List published in Alcoa's Portland "Environment Effects Statement" (1979), prepared by the consultants, Kinhill Planners Pty Ltd. The botanists acting as sub-consultants were Dr R. Parsons, G.W. Carr and A.C. Beauglehole and *Caladenia hastata* was recorded in the list of orchids as a species. With this authority substantiating specific rank, I had no alternative but to describe *C. hastata* as a species and not a form of *C. reticulata* – and I apologise for omitting this information earlier.

Yours sincerely,
Dorothy Woolcock
36 Townsend Street
PORTLAND, Vic. 3305

21 April, 1980

Line Breeding our Species

Dear Sir,

Just received *The Orchadian* and read the article on *Dendrobium antennatum* by P.S. Lavarack. What this immediately brought to mind was that here is an orchid which one seldom sees advertised for sale from nurseries or hybridizers and yet there must be many growers like myself who would love to own an Australian clone of this species. Surely here is an opportunity for the owner of one of the Australian plants to pollinate his or her plant and thus increase its numbers without having the problem of people stripping it from its habitat. Roger Bedford wrote an excellent article on the hybridizing of dendrobium species but I still think there are not enough people propagating species or better clones of species.

George Nieuwenhoven
15 Robin Terrace
HOPE VALLEY, S.A. 5090

April, 1980

Taronga Park Zoo – Native Orchid Project

Dear Sir,

In late August, 1979 a group of members from the ANOS Sydney Group went to the Zoo to prepare ground and plant native orchids. The area given by the Zoo authorities, which is adjacent to the Koala enclosure, is ideal for the purpose.

There had been a trip to Mangrove Mountain a week or so before, where native orchids had been collected by courtesy of the Water Catchment Authority.

Members also gave of their own collections and all of these were positioned on rocks, in crevices, trees and also in the ground.

A return trip was made to the Zoo to weed and plant more orchids, and with the help of one of the attendants, trees, which had been provided by the Zoo authorities, were planted.

Things were looking very healthy and making good progress and then last week (4.5.80) it was found that at least 20% of the plants had been removed without permission of the Sydney Group, and unbeknown to the Zoo authorities. They were taken from an open-face rock area. This kind of activity is despicable and hard to believe. It takes the shine off the project, but we will endeavour to replace the plants, which were mostly *Dendrobium speciosum* and *D. linguiforme*.

This is a new concept for orchid growing and we hope it will continue to flourish and grow.

F.D. Martin
Editor, *Orchidophile*
ANOS Sydney Group

14 May, 1980

SPRING SHOWS – 1980

- **Sydney and Warringah ANOS Group's SIXTH ANNUAL SPRING SHOW**

With a revised schedule and double the number of sections we are looking forward to a larger and even more interesting show this September.

Any intending exhibitors in Section 22 – **"Best Interstate or NSW Country cutflower exhibit of Native Orchids by an ANOS member or group"**, please contact the Show Marshall so the necessary arrangements may be made.

Negotiations are underway for special exhibits which should be of interest to the novice as well as the more experienced grower. Keep this in mind if you are looking for better ways to grow your orchids.

SHOW DETAILS:
Mona Vale Community Hall – Pittwater Road & Park St.
Friday, 12th September – Benching only – noon to 10 pm.
Saturday, 13th September – 9 am – 9 pm.
Sunday, 14th September – 10 am until Prize Giving at 4 pm.
Enquiries: Show Marshall – Norman Hilliger
14 Wangara Street
Mona Vale, 2103
Phone: 99 2468

A *Spring Show Schedule 1980* is enclosed with this issue. So start planning now for entries in the 25 competitive sections.

- **Blue Mountains and District O.S.**
  BIGGEST EVER Australian Native Orchid and Hybrid Display & Spring Show to be held in the West (of Sydney area)

The Blue Mountains & District Orchid Society, a society very strong in most Australian orchids and their hybrids, are holding in conjunction with their Spring Show a big promotion of Australian orchids in that section of their show. This society always has one of the largest displays of Australian natives and their hybrids in Sydney. This year the Society is putting on gold medals for the species as well as hybrids along with cash prize money.

Blue Mountains & District Orchid Society spring show committee is proud of the fact that for years they have had more classes for Australian natives and their hybrids than any other society. For the last two years they have had a photographic section. This section was included because at shows, we see so many photographers taking photos; but also what a good way to show off a good flower that is not out at showtime, or for people who live too far away to come to the show, as they can post in their photographs. This section has proved to be very popular.

The show is being held at the MELROSE HALL, EMU PLAINS right on the GREAT WESTERN HIGHWAY, on the long weekend, 4th, 5th and 6th October. Setting up will be from 2 pm – 10 pm, Friday 3rd October.

Anyone requiring further information or a show schedule may contact the Secretary, Mr M. Wilde, Lot 4, Singlesridge Road, Winmallee, 2777 or phone (047) 54 1436.

- **Hastings Valley ANOS Group**
  will hold its Second Annual Native Orchid Show on SATURDAY, 11th October, 1980. The setting up of this show will be on the afternoon and evening of Friday, 10th October, 1980. For further details contact the Group by telephoning Wauchope 856.

- **Wollongong & District ANOS Group**
  will hold their 1980 Spring Show at the Warrawong Shopping Centre on Thursday, 25th, Friday, 26th and Saturday, 27th September.

SOME THOUGHTS ON *DENDROBIUM SPECIOSUM* J.E. Smith

by Ted Gregory

One of the first things I discovered on moving to Queensland was that, if I mentioned "Speciosum", people would just look at me as if I was showing off my latin; but say "King Orchid" and everyone gets the message immediately. Many nicknames are rather inappropriate, but if ever an orchid was suited by such a name, surely it must be *Dendrobium speciosum*, for nobody who has seen a cliff face covered by this plant when in full flower would say that it was anything but a king among plants.

For the sheer effect these massed displays on rocks take some beating, but I remember one Cordaroy beech that was host to over seventy adult *D. speciosum,* and countless *D. gracilicaule, x gracillimum* and *Sarcochilus falcatus.* This superb tree stood for centuries in the head of a gully only to fall to the chainsaw when the beef boom was at its peak. Now this glorious rainforest is replaced by a tangle of tobacco bush and lantana.

Dendrobium speciosum must be just about the most widespread of any of our Australian native orchids; being found almost the full length of the Great Dividing Range, from well down in Victoria to far northern Queensland, growing anywhere from the seashore to the top of this range, and in some cases creeping across the top into the inland.

At various stages *D. speciosum* was divided into many sub-varieties which have now come to be regarded as just localised forms of the same orchid except for the following: *D. speciosum, D. speciosum var. hillii,* and the form "compactum" from the Atherton Tableland. I will deal briefly with each form in the order in which I mentioned them.

The standard form of D. speciosum var. speciosum is a very robust plant that will grow into huge masses over the years. I remember years ago in the New South Wales Illawarra region seeing whole rockfaces just carpeted with these plants. It is a very slow orchid to mature, I have had seedlings take up to twelve years and more to become adult and flower. On this the type form the canes are very heavily built and normally from twelve to eighteen inches in length, with some over three inches thick at the base, tapering fairly quickly to the top. This form is mainly a rock dweller, although it is not uncommon on trees. Some of the rock-dwelling forms have very curved canes, whereas the epiphytes seem to grow much straighter.

The leaves of this form are very heavy and in a good season they are often over three-eighths of an inch thick when they mature. They are rich green in colour, even in full sun, and have quite a waxy sheen to them. They are normally from six to eight inches long and about half this in width. There are usually four or five of these leaves at the top of each cane, but this can vary from two to eight, depending on the health of the plant.

The flower spikes are produced from eyes at the head of the canes, there usually being an eye between each pair of leaves and two at the apex of each cane. It is one of the marvels of this plant that the same eyes will produce spikes for years. The spikes are normally about a foot long but on some clones will be nearly as long again, and will carry from twenty to sixty flowers. These flowers are heavy textured, starry and generally about an inch and a quarter to an inch and a half wide, though an odd superb clone will nearly double this.

The flowers are normally a rich, creamy yellow with a very potent musky scent. In some areas of the Illawarra and Hawkesbury escarpments this scent could be overpowering on a warm spring evening. Also the Hawkesbury form at times was quite buff-coloured with a very big flower.

This *speciosum* is the form that extends from Victoria to about Alum Mountain near Bulahdelah in New South Wales, where this type reaches its full glory. It was never as dense here as further south, but the individual clones were magnificent, with a lot of them having a beautiful deep golden coloured flower.

D. speciosum Sm. var. hillii (Hook.f.)F.M. Bail — From here northward *D. speciosum var. hillii* appears to take over and completely replace straight *speciosum* for the rest of the length of Australia. Var. *hillii* is generally a more lanky grower, with canes that will grow to well over a metre in length, with leaves that are more slender; in fact the plants are more slender all over. Even though the plant is quite different, I find that the biggest difference is in the flowers themselves. The racemes are up to two feet in length at times with just a mass of flowers on them, up to almost two hundred at times. These flowers are quite often not much more than half the size of straight *speciosum.*

Colour-wise, there appears to be more variation in *var. hillii* too, with a range from pure white to light cream and a deep gold thrown in. Pure whites were fairly rare in straight *speciosum* but are quite common in *var. hillii.*

I guess it is just nature at work and the different terrain; for as we move north we go out of the sandstone country into more of a rainforest environment. Hence we find our "rocklily" growing more on the trees and less on the rocks. Another feature of *var. hillii* is its habit of throwing up masses of roots vertically into the air. I guess this has to do with the more humid environment in which *var. hillii* normally grows. Straight *speciosum* may do this in the wild, but I have not been fortunate enough to see it to any great extent, although it will do it at times in the bushhouse, particularly if the plant happens to be in a compost that is a bit on the wet side.

Another observation is that in my experience all forms of *D. speciosum* will send up a tremendous amount of new growth one season and then flower rather poorly the following; yet the next season will be exactly the opposite, with only a few growths and a million flowers. In my years with orchid shows in the Manning/Hastings area this has been really noticeable: that they absolutely dominate the show one year and then become quite scarce the following year. I hope other Orchadians will come forward and comment on things like this, as no one in one lifetime has much chance of covering any orchid completely; especially one with the range of *D. speciosum.*

D. speciosum, "compactum" form — And last, but not least of the forms I mentioned at the beginning, is the variety "compactum" from the Atherton Tableland area of Queensland. This type is extremely interesting, both in habit of growth and form of flower. Some clones of this form have canes up to one foot long, which is more or less standard *speciosum* size, but the canes are slightly different in shape, being more bottle-shaped than *var. speciosum* or *var. hillii,* which seem to taper fairly evenly from base to leaf.

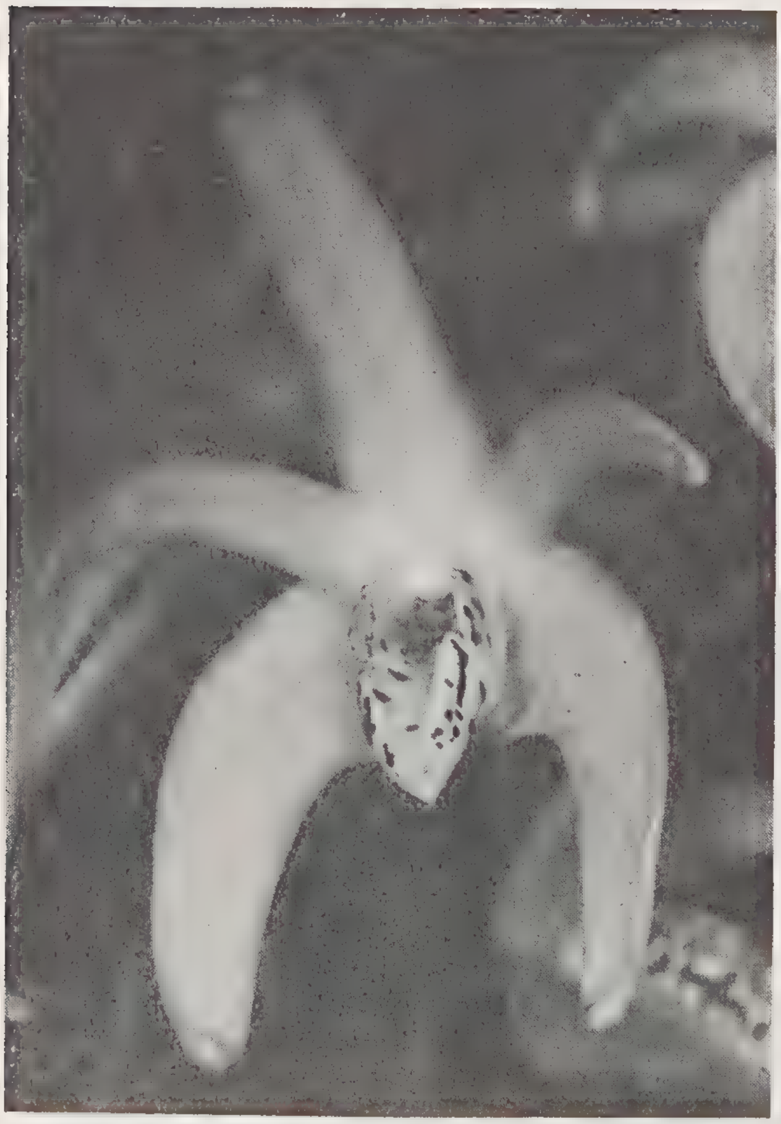
At the other end of the scale are clones that have canes of no more than three inches in length, looking rather like patches of potatoes with leaves on, or, if you are lucky, flowers as well.

The leaves of this form are also different, being more or less oval, with the size in keeping with the rest of the plant.

However, it is the flower of "compactum" that interests me more than any other aspect of this type. The racemes on some forms are very long, up to two feet, which looks incredible on a plant that is so compact in every other regard; and whereas other forms of *D. speciosum* carry flowers on the full length of the spike, this type only has flowers on the outer half of the spike. Also the flowers are much rounder in the segments than the average straight *speciosum* of my experience, and these flowers also seem to open much flatter. The size is considerably smaller than the flower of the southern *speciosum,* running at a little over an inch on the plants that I grow.

The colour range is more or less average for *speciosum* from deep cream to the purest white, in fact I have one clone that is absolutely white, or "concolor", as they say in the cymbidium world.

Breeding and the "red factor" — We have started to do a bit of breeding with these "compactums" in the hope of finding that fabled red factor that we hear of now and again but have never been able to pin-point. My biggest problem was in acquiring enough clones to make comparisons worthwhile as one cannot make comparisons on one or two clones. However, we now have about twenty different clones going and hope to learn a lot from them over the next few years.



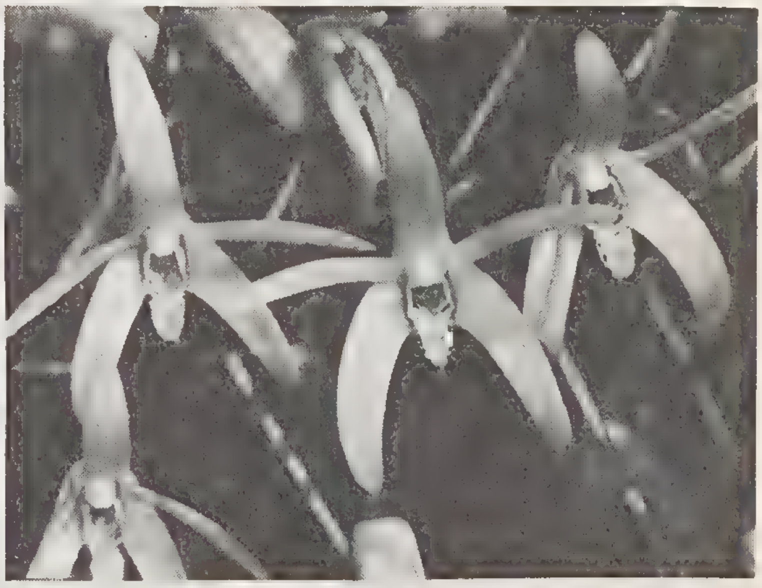
(left)
Dendrobium speciosum var. speciosum J.E. Sm.
Photo: G. Wells

I have quite a few crosses of these "compactums" going just out of curiosity; just with *D. kingianum,* seeing if we can trace the strength of the red factor. One of the strangest things to show so far in the seedlings is the fact that seedlings of the pure white, that I mentioned above, were a striking red colour before they even left the bottles. Whether this means anything or not I guess we must wait and see, but the colour in those seedlings surely is interesting. The seedlings of a cream "compactum" used with the same *D. kingianum* show virtually no colour at all in the plants themselves. If one of these clones does carry a red factor, perhaps one of these days we will see that pure red *D. X delicatum* that has eluded me for quite some time now.

D. speciosum is such a huge grower and free flowerer that I think we must see great advances in hybridizing with it over the rest of this century. The great pity is that it seems to impart its initial slowness of growth to most of its progeny. But it also imparts vigour, and once its crosses approach maturity, they really move.

Personally, I think that in these hybrids will be our first commercial flower, except of course for the *D. bigibbum* hybrids which have been famous for years. Perhaps one of these days someone will cross *D. speciosum* and *D. bigibbum,* and just imagine the result! The vigour of *D. speciosum* and the flowers of *D. bigibbum*! Enough to make any orchid grower's mind boggle. But this is not as far fetched as it may seem to anyone who has seen the results of *D. speciosum* X D. Hastings or *D. speciosum X D. fleckeri,* to mention a couple that come to mind as I write this.

Vandalism: — One of the tragedies of orchids in this country is the fact that the big and showy ones have been more or less wiped out by vandals in certain areas of our best bushland. I know of areas where *D. kingianum* and "rocklilies" grew together in profusion when I was a youngster, and as a result *D. X delicatum* was not uncommon. But people have wiped out the *D. speciosum* in some of these areas, so there goes all chance of ever finding *X delicatum* in those parts again. Hopefully one of these days we will be able to restore the *D. speciosum* in these areas and be able to sit back and let nature do her own thing once again. Even though we can never replace the rainforests and big scrubs, I can see no reason why we cannot set aside areas of escarpment country and restock it to its former glory. Just imagine a gorge of the Hawkesbury in the glory it had fifty years ago! Perhaps one day we will have human beings without itchy fingers.



Dendrobium speciosum var. hillii (Hook.f.) F.M. Bailey
Photo: G. Wells

Culture: — I must take my hat off to speciosum, as it must surely be one of the toughest orchids known to mankind to kill, as I have seen it survive where no other plant would have a chance. To grow it in captivity and do it justice requires a bit of common sense, just as any other plant does. The main thing is the same as with all Australian dendrobiums, and that is perfect drainage. Any mixture that will give this and not break down quickly will do well. *D. speciosum* is so tough that it will grow in almost anything, but I still like that terracotta pot, if possible. If sandstone is obtainable, lumps of this in a container will suffice; in fact I saw a show won by a plant that had just been jammed into an empty terracotta pot. In case the judges' ears pricked: it had been jammed in two years before!

D. speciosum will also grow extremely well strapped to a tree or stump or just set on rocks in the backyard. In fact it will often do best in these situations as it loves strong light, and in full sun it seldom has the fungus problems that it can have when grown in a shadehouse.

But I do wish that the people who grow them on trees or in their yards would make some effort to control the dendrobium beetle on them. I do think that these people are one of the reasons why the beetle has got to be such a problem at the moment. Talking of the beetle reminds me of Lansdowne Press's superb reproduction of R.D. FitzGerald's works: When my young son was looking through them he thought the illustration of *D. speciosum* with the beetle on it was fabulous. And, just quietly, so did his dad! I am a bit of a romancer, and just to touch these volumes, and to see and smell them, is to step back into a golden age. Makes me wonder just how much are we missing in this modern age when pride of workmanship is a dirty word and we are all controlled by the square box. This may sound a bit of a rash statement but it will be interesting to see how the human race is doing at the end of this century, as well as our orchids.

Another thought that comes to mind concerning *D. speciosum* is the huge amount of seedpods that I have seen on it in some seasons and then one will go for years and hardly see a pod in the wild. Is this due to a shortage of pollinators or does it need an optimum season before *D. speciosum* will carry pods to maturity ?

We all know that the dendrobium beetle plays havoc with the pods of all cool dendrobiums, so I guess this little beastie may also be a pollinator as well, as Mother Nature has used this system before as one of her ways of making sure that any one type of plant does not become too dominant and choke out some of its weaker relatives.

Natural and Man-made Hybrids: — *D. speciosum* has had quite an influence on our native orchid scene: firstly in the wild with its two beautiful natural hybrids, *D. X gracillimum* and *D. X delicatum.* Both of these were not uncommon in areas where both parents were reasonably common.

To my knowledge, *X delicatum* was naturally made with both var. *speciosum* and var. *hillii* as one parent, and this is fairly easily seen in the cane length and shape of most clones. This is also borne out in the man-made crosses of this type.

With *X gracillimum* however, to my knowledge only var. *hillii* has been a natural parent, and this is easily seen in the natural crosses that I have seen when they are compared with the man-made hybrids using *D. speciosum.* The "man-mades" are much stouter in the canes, and the leaves are also thicker and waxier.

I guess the aim in using var. *speciosum* in the man-made cross was to obtain a larger flower on a more compact plant. This worked on the plant side, but not so well on the flower end of the business, with most of the "man-mades" being inferior in flower size and spike habit as well. Quite a few growers now have *X gracillimum* with var. *hillii* as one parent and it would be interesting to see how they turn out, and it should make the difference between the parents more clearly known. To make matters more complicated, we have a batch of seedlings here of the "selfing" of a natural *X gracillimum* that seems contented to stay like a baby *speciosum,* staying very short and fat just like pure *speciosums.* Perhaps they will make up their minds one day, but it will be worth watching just to see what happens to them.

As a final thought, these selfings should help to prove one of my old arguments as to whether this cross has selfed quite frequently in the wild, as these *X gracillimums* were once common in some areas, with some areas having types that were very much alike.

D. speciosum has had a big influence on our hybridizing as is commonly known these days; to the extent that I will not dwell on this at the moment, but will close with the hope that more and different crosses will be made in the future with this king of our cool growing dendrobiums.

"Merrellen", Oxenford Road,
2 May, 1980 MOUNT TAMBORINE, Qld. 4272

SPIRANTHES SINENSIS (Pers.) Ames (with notes on cultivation)

by R. Bates

By courtesy of the Journal of the Native Orchid Society of South Australia, March 1980.

The evergreen terrestrial orchid *Spiranthes sinensis* (Persoon) Ames, the "Austral Ladies Tresses", has a wide distribution from Siberia through the Himalayas, highland areas of Indonesia and New Guinea to Australia and New Zealand. As could be expected of such a widespread species there are numerous forms, yet flower morphology is constant enough to ensure that varieties have not been named.

In South Australia, where the species is restricted to a few swamps in the south-east and Mt. Lofty Ranges (to Lake Alexandrina), there are three dinstinct, true breeding clones. Spiranthes from the south-east flower in autumn but when cultivated in Adelaide this leafy, large-flowered form begins flowering in February. The "common" clone from the Mt. Lofty Ranges flowers in midsummer. It is robust in cultivation, with pink and white blooms. In Adelaide it will flower in November/December.

A rarer clone from the peat bogs near Spring Mt. is a true white race. The flowers are smaller but the crisp crystalline-white blooms are delightful. This form tends towards autogamy. In cultivation it may flower from November to March. It is unlikely that this form developed in South Australia, more likely it was a separate introduction. (White-flowered plants may turn up in other clones but these, if selfed, produce a percentage of pink flowers.)

The smaller but brightly coloured Queensland form flowers in Adelaide in November. By growing several clones, and with the aid of a glasshouse, it is possible to have Spiranthes in flower all the year round.

There is no need in cultivation to try to simulate their natural swampy environment as they respond very well to pot culture in a variety of soils. I use natural bush soil to which 50% peat moss is added. It may be safer to use plastic pots but my south-east form is doing well in a *squat clay* pot — which may seem unusual considering the long tuberous roots of this species. (In the squat pot they form an almost complete mat in the bottom.)

Spiranthes seem to benefit from the regular application of organic fertiliser and because aphids and thrips attack the buds, treatment with systemic insecticides is recommended.

In summer, when I must leave mine for extended periods, I sit the pot in a bowl of water. Weekly waterings are needed from October to March. Seedlings appear regularly in pots if seed is allowed to fall when ripe but some growers find that seedlings come up all over the place doing this.

Spiranthes also increase vegetatively and plants can be divided after flowering by washing all soil away from the roots and carefully breaking the plants apart at the top.

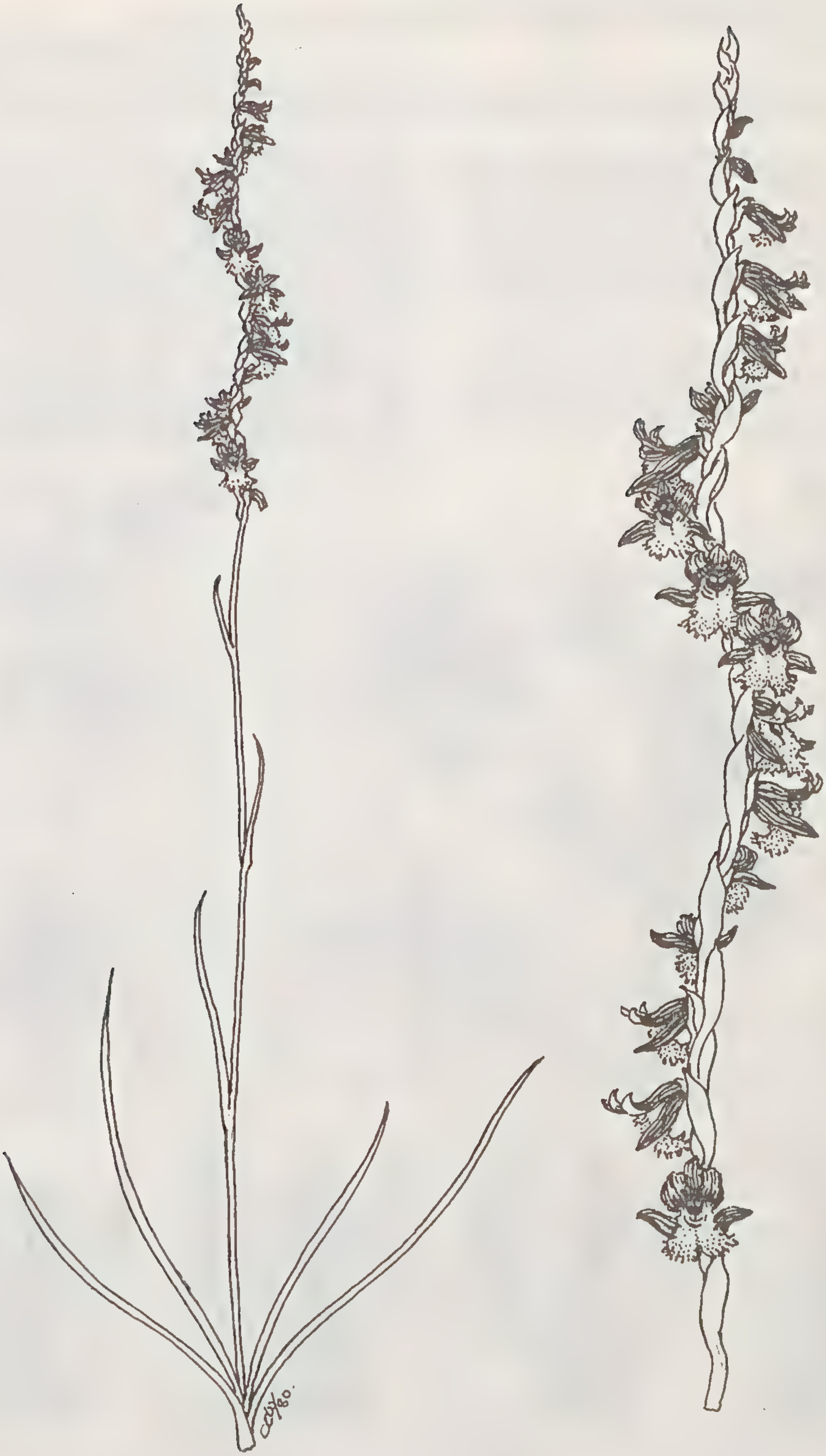
Spiranthes sinensis is a terrestrial that epiphyte growers can handle. A pot could be placed next to *Dendrobium kingianum* and given the same treatment.

COMMENT ON THE TAXONOMY

by D.F. Blaxell

Spiranthes sinensis (Pers.) Ames ssp. *australis* (R.Br.) Kitamura is the currently accepted name (in the forthcoming "Census of N.S.W. Plants" from the National Herbarium of N.S.W.) for the plant previously known as *S. australis* (R.Br.) Lindl. and, in recent years, *S. sinensis* (Pers.) Ames. A Japanese botanist (Kitamura) in 1975 divided the widespread species into two sub-species, of which ssp. *australis* occurs in Australia, New Zealand, New Caledonia and further north to Asia. What the exact distribution of the two sub-species is, has yet to be ascertained since Kitamura's article was in Japanese. Also, the morphological differences between the two taxa (if any) are still to be ascertained. Hopefully, these points will be clarified when the article is translated into English.

The National Herbarium of N.S.W.
May, 1980 Royal Botanic Gardens, Sydney



Spiranthes sinensis (Pers.) Ames *ssp australis* (R.Br.) Kitamura

Drawing: C.E. Woolcock

By arrangement with the Director of the Adelaide Botanic Garden we publish the following summary of a paper published in J. Adelaide Bot. Gard. 1 (6): 357-360 (1979): —

A PUTATIVE HYBRID BETWEEN *PRASOPHYLLUM ARCHERI* and *P. DESPECTANS*

by R. Bates and J.Z. Weber

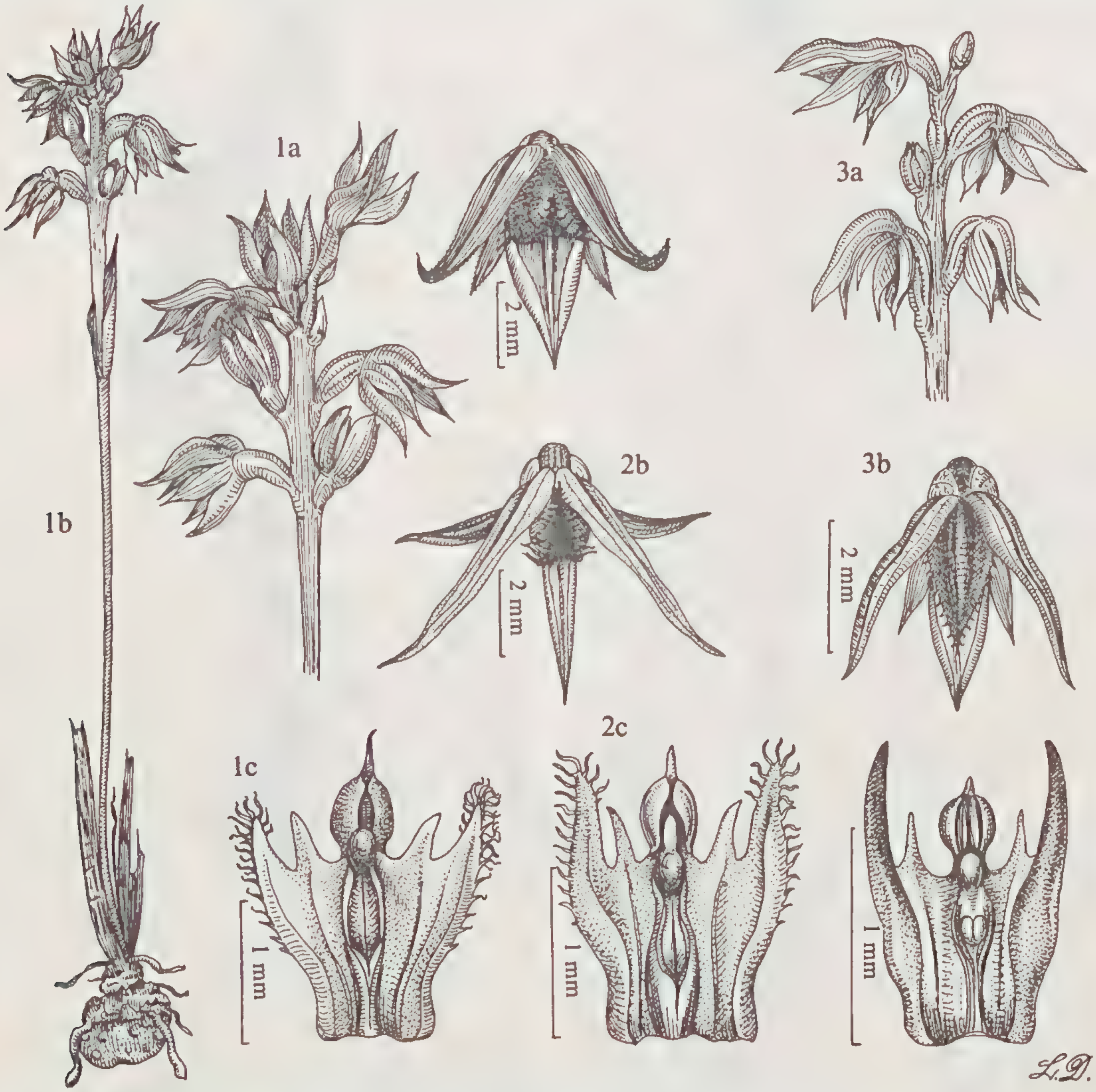
Abstract: A putative natural hybrid between *Prasophyllum archeri* Hook.f. and *P. despectans* Hook.f. is reported from Glencoe, South-Eastern region, South Australia. The differences between the putative hybrid and its parents are tabulated and illustrated.

Plants with many morphological characters intermediate between *P. archeri** Hook.f. (1858) (syn. *P. intricatum* Stuart ex Benth., 1873, *P. ciliatum* Ewart & Rees, 1912) and *P. despectans** Hook.f. (1858) (syn. *P. brachystachyum* sensu A.J. Ewart, 1931, non Lindl., 1840) were collected with these species by R. Bates near Glencoe at Honan's Scrub, Woods & Forest Department Reserve (37° 42'S; 140° 37'E) on 15 April, 1976, and again in April 1977 and 1978.

(*Identification of the parent species accords with current literature (e.g. Weber & Bates, 1978), but the section to which they belong is under revision by Mr D. Blaxell (National Herbarium of N.S.W.) and their names are subject to possible alteration.)

Both species are commonly and widely distributed through some 50 hectares of bush, occurring predominantly in leached sands on the margins of swamp and flowering most profusely in areas burnt the previous spring. The incidence of heavy rains affects the flowering times of both species, especially *P. archeri* which may flower earlier following heavy rains in late summer. Both species are usually found in association with *Xanthorrhoea australis* R.Br. (grass tree).

P. archeri occurs in South Australia in the Southern Lofty and South-Eastern regions and in all eastern Australian States, flowering from mid-March through May in South Australia and western Victoria. Its height varies from 5 to 25cm and inflorescences contain 2 to 15 flowers.

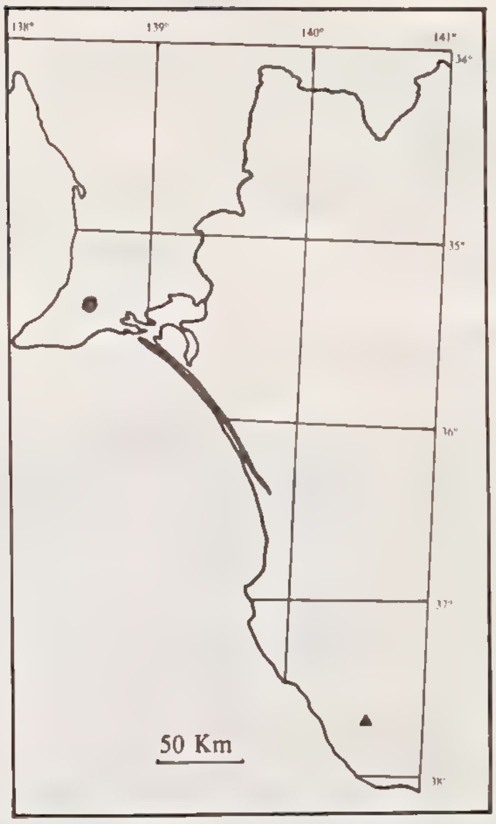


Figs. 1-3: 1. *Prasophyllum archeri.* 2. Putative hybrid between *P. archeri* and *P. despectans.* 3. *P. despectans* (a, raceme; b, flower; c, column from the front more or less opened). Note that several features, for example labellum shape and the angle of the sinus between the lateral sepals, cannot be determined from the illustration due to the effect of perspective.
— Illustrations by L. Dutkiewicz.

P. despectans is presently known in South Australia from a single locality in the South-Eastern region. Due to the diminutive size of both *P. archeri* and *P. despectans* it was not until 1970 *(P. archeri)* and 1976 *(P. despectans)* that the species were first collected in the South-East, but it is likely that they were widespread in the region before extensive destruction of habitat. *P. despectans* occurs elsewhere; in south-eastern New South Wales, is widespread through western Victoria and Tasmania and flowers from mid-February through April in South Australia and western Victoria. Both species are visited by the same insect species, identified at the South Australian Museum as a drosophilous fly *(Chloropidae)*.

Only six specimens of the putative hybrid have been collected over three years, partly because the extremely small size of the plants makes detection and identification in the field difficult. No evidence of back crossing was found and the absence of mature capsules may suggest infertility in the hybrid. The authors have found no other evidence of hybridization between species of Prasophyllum in the literature. The absence of intermediates between the putative hybrid and parents makes it improbable that the hybrid is a phenotypic product of local variation in environmental conditions.

In Table 1 the more important characters of the putative parental species and the putative hybrid are indicated. The specimens illustrated (Figs. 1-3), and on which Table 1 is based, were selected to represent the entire known morphological range of this population. The putative hybrid shows intermediacy in the dimensions of many vegetative and floral structures. The perianth of the hybrid tends to be less spreading than in *P. archeri* but more than in *P. despectans*. The petals are longer than either parent. The colour of the petals of *P. archeri* is green, of the putative hybrid greenish towards the base but purplish towards the apex, and of *P. despectans* purple throughout. The labellum of the hybrid resembles that of *P. archeri* in having a ciliate margin, but is intermediate in shape between the parent species. The most conspicuously intermediate character is in the column appendages (Fig. 2c) which equal the anthers in height; in *P. archeri* (Fig. 1c) they are shorter; those in *P. despectans* (Fig. 3c) exceed the anthers. Like *P. archeri*, but unlike *P. despectans*, these appendages are fimbriate in the hybrid. The anther point of the hybrid is intermediate in length between the parents. The ovary has not been observed to become swollen after fertilization as in *P. archeri* and *P. despectans* the ovaries of which reach 1 mm or more in diameter. This is considered as an indication of sterility.



Map 1: Occurrence in South Australia of *Prasophyllum archeri, P. despectans* and their putative hybrid (triangle) and further distribution of *P. archeri* (dot).

REFERENCES:

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Lindley, J. (1840)	"The Genera and Species of orchidaceous Plants". (Ridgway: London)
Weber, J.Z. and Bates, R. (1978)	Orchidaceae in Black, J.M. (Ed. Jessop, J.P.). "Flora of South Australia". Vol. 1, 3rd ed. (Govt. Printer: Adelaide).

R. BATES
Portmarnock Street
Fairview Park,
South Australia 5126

J.Z. WEBER
State Herbarium
Botanic Garden, Nth. Terrace
Adelaide, S.A. 5000

Table 1: Characters by which *Prasophyllum archeri* and *P. despectans* differ and the state of these characters in the putative hybrid.

Feature	P. archeri	Putative hybrid	P. despectans
Plant height	6-14 cm	8-12 cm (6 collections)	5-20 cm
Scape diameter	c. 0.8 mm	c. 0.5 mm	c. 0.4 mm
Flower number	3-8, crowded	3-15, not crowded	3-20, not crowded
Distance between tips of lateral sepals	c. 7 mm	c. 5 mm	3-4 mm
Flower colour	red and green	purple and green	purplish
Labellum dimensions	c. 3 x 1.5 mm	c. 3 x 1 mm	c. 2.5 x 0.6 mm
Labellum colour	green, edge red	maroon	purple
Labellum margin	ciliate	ciliate	irregularly serrulate to entire
Labellum apex	bluntly acute, recurved	acute, recurved	acuminate, straight
Lateral sepal length	4-5 mm	4-5 mm	3-4 mm
Lateral sepal shape	crescentic	curved, divergent	straight, divergent
Angle of sinus between lateral sepals	more than 90°	75° – 90°	45° – 60°
Petal dimension	c. 3 x 0.9 mm	c. 4 x 0.9 mm	c. 1.5 x 0.6 mm
Petal shape	lanceolate, straight	narrow lanceolate, falcate	ovate, acuminate falcate
Column appendages	shorter than anther point fimbriate	as high as anther point fimbriate	higher than anther point smooth
Column tip	wide, bluntly acute, straight	acute, straight	acuminate, incurved
Anther appendage	c. 0.4 mm long, acuminate	c. 0.25 mm long, acute	c. 0.05 mm long, mucronate
Ovary diameter (unfertilized)	c. 0.7 mm	c. 0.7 mm	c. 0.5 mm

The characters are based on the limited number of specimens examined from Honan's Scrub.

NEW AUSTRALIAN NATIVE ORCHID HYBRIDS

The following R.H.S. registrations of new Australian native hybrids are reported from *The Orchid Review* for April, 1980 (January and February 1980 registrations): —

HYBRID NAME	PARENTAGE	REGISTERED BY
Dendrobium		
Ella Victoria Leaney	*kingianum* x *ruppianum*	D.M. Cannon (W.G. and J. Cannons)
Eureka	*fleckeri* x *ruppianum*	D.M. Cannon (W.G. and J. Cannons)
Sarcochilus		
Shooting Star	*fitzgeraldii* x *australis*	David Banks

For many years the *D. kingianum* x *D. ruppianum* cross has been known throughout Australia as "D. Ella V. Leaney". It was made by the late Reg Leaney who died without effecting registration. It was also made, very successfully, by the late Ira Butler. Mr Leaney had expressed his intention of naming it after his mother — as "Ella V. Leaney" — and this precise name was applied everywhere on the assumption that it had been so registered. Because of the floriferous beauty of many of its clones, this hybrid has become very well known over the years (see fig. 1, photograph of Mr P. Collin's D. Ella V. Leaney 'Helen' CC/OSNSW and inset close-up. Fig. 2 shows a very dark pink clone, photographed by David Banks). We first noticed the omission to register when preparing our ANOS "Checklist of Australian Native Orchid Hybrids" (1977) and ANOS Council initiated action to have it registered by the RHS. We have no idea why it has been registered by Mr D.M. Cannon of Victoria, but we understand that somebody felt that the *capital* letter 'V' in the traditionally accepted name was unacceptable because it might be taken to signify *'variety* Leaney'! Surely not, when the lower case 'v' is confined to the botanical latinised names of species — and never applied to hybrids! The official name now to be used is certainly the longest name ever applied to an Australian hybrid. (Check your "Checklist").

As for D. Eureka (= *D. fleckeri* x *D. ruppianum*), fig. 3, it can be said (though we have no comments from Mr Cannon) that this primary hybrid, too, was long overdue for registration. I describe it from memory as having a beautiful, well filled-in star shape. Its yellow colouring as well as its shape and size rivalled the much acclaimed D. Peter (fig. 4) (= *fleckeri* x *falcorostrum*). My memories are drawn from the September Spring Shows of 1975 and 1976 by the Sydney and Warringah ANOS Groups. In 1975 the hybrid championship silver medal went to Mr Norman Hilliger's plant and again in 1976 the championship went to the same cross for a plant owned by Mr Ian Carter. More recently I have seen really fine clones of D. Eureka owned by Mr D. Barnham and by Mr R. Lowe. Neither of these plants has been exhibited at a major show. Both are said to have been originated by Ira Butler. We may well ask whether any of Butler's many successful hybrids will ever be registered with his name ?

With **Sarcochilus Shooting Star**, for once we do have early information. The registrant and originator of this hybrid, David Banks, has already submitted to us an article on "Knowing and Growing Australian Sarcochilus" (to be published shortly). To quote from this article in advance: — "I have been hybridising with the genus Sarcochilus for about four years. The first of my crosses, *S. fitzgeraldii* x *S. australis* flowered in the Spring of 1978. The plant produced six flowers on the raceme — the shape of *S. australis* but with a purple centre. Plant form is like *S. fitzgeraldii* and very vigorous." At next flowering we hope to obtain a photograph of S. Shooting Star suitable for reproduction.

— EDITOR

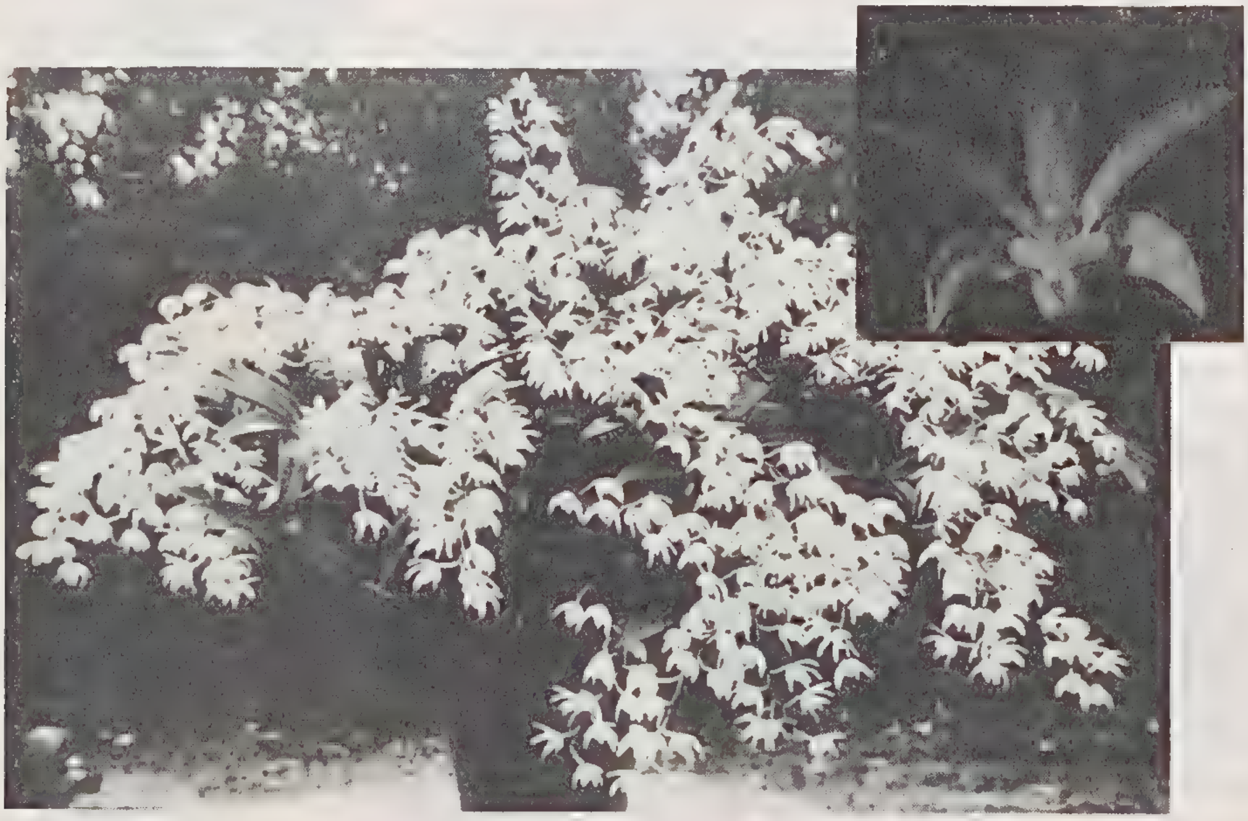

FIG. 1: Dendrobium Ella Victoria Leaney 'Helen' CC/OSNSW (Oct., 1978) owned by Mr P. Collin. For sheer delicacy of colour tonings (pale pink into cream) this clone demands attention. Its prolific flowering is late Spring — missing the September shows, but compensating for this with its display. Flower shape (inset) does not excel. Fig. 2 (p. 191) shows another clone with deep pink shading.

Who's Who

THE AUSTRALASIAN NATIVE ORCHID SOCIETY OFFICERS AND GROUP CONTACTS:

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- *Warringah Group:* Tel.:(02) 99 2468
  Meets 8 p.m. 2nd Thursday, Stony Range Flora Reserve, Pittwater Road, Dee Why.
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- *Wollongong & District:* Secretary: Mrs E. Beileiter, 19 London Street, Berkeley, 2506.
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- *Hastings Valley Group:* Tel.: Wauchope 856 — Meets 7.30 p.m. 4th Friday at Beechwood Uniting Church Hall, Wauchope.
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- *Darling Downs Group:* Secretary: Mrs J. Leyden, 66 Mort Street, Toowoomba, 4350. Tel.: (076) 34 2813
  Meets 7.30 p.m. 3rd Friday at the Auditorium of the Technical & Further Education Centre, Old Empire Theatre, Neil Street, Toowoomba.
- *Native Orchid Society of Queensland (Affiliated):* c/- P.O. Box 159, Broadway, Qld. 4000.
  Meets 8 p.m. 1st Monday at Bread House, 49 Gregory Terrace, Brisbane.

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- *W.A. Native Orchid Study and Conservation Group (Inc.) (Affiliated):* Tel.: (09) 337 9614
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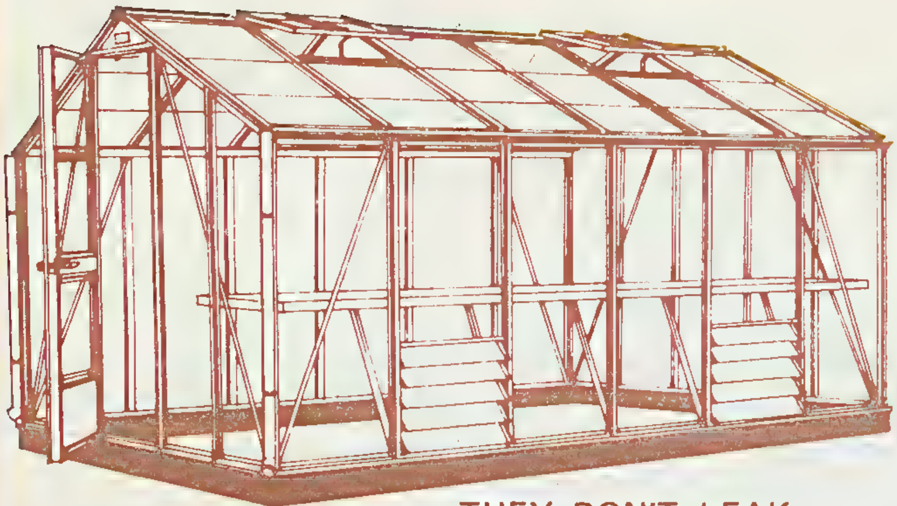
D. Ella Victoria Leaney (deep pink clone)
Photo: D. Banks

D. Eureka
Photo: P. Collin

D. Peter
Photo: P. Collin

BACO BUILDS BETTER GLASSHOUSES



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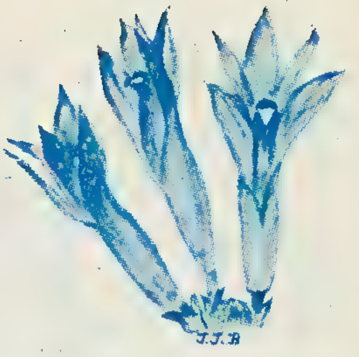

Dendrobium delicatulum Kraenzl.

SEPTEMBER, 1980

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1st September, 1980

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THE ORCHADIAN

Founded August, 1963

Editor: J.J. Betts
Honorary Associate Editors: Dr N.J. Grundon (Qld.), Mr J. Simmons (S.A.)

Volume 6 September, 1980 No. 9

EDITORIAL

For some time past it has seemed to your editor at least, that *The Orchadian* has attained most of its objectives within the constraints of funds available. Each issue has seemed to surpass its predecessor in one way or another and for this the credit goes to our contributors. Just as the number of subscribers has increased, so has the number of contributors. It is apparent that success really does breed success. The editor's main problem now is the pleasant one of selecting, timing and arranging the presentation of so much good material — while at the same time maintaining a proper balance between "cultural" and scientific articles.

In spite of funds limitations, this issue has been expanded by four pages. And yet it has still been necessary to leave out "Letters to the Editor" and a book review, to cut short our notes on new hybrids and defer some "cultural" material. I am sure that all our readers, whatever their predominant interests may be, will recognise in the present issue the significance of the taxonomic papers that have the lion's share of the expanded space.

Recently I have examined fairly closely the contents of some of my favourite orchid periodicals for purposes of comparison with *The Orchadian.* First they are all thicker (more pages, that is) and more glossy. Secondly, the advertisement content is much greater. And, of course, they all have colour photographs of orchids. These are the superficial impressions. Taking a deeper look I was surprised to find that the total printed reading matter in some of them could have been accommodated in about two-thirds of the printed area of our normal 24-page issue. Our initial choice of a small but clear typeface for volume 6 accounts for this; so there is no question about value for money.

This quantitative comparison, of course, says nothing about the quality of the contents. For the latter we depend upon our contributors and they have certainly not been found wanting. Our only complaints are that good articles on cultivation techniques are still hard to come by and registrants of new hybrids are far too reticent about their motives and programmes (if any). More letters to the editor would also be appreciated. *All contributors* might please note that photographs to illustrate articles are very welcome. Colour slides and prints *can* be converted to black and white glossy prints if the contrast is sufficient. If you submit black and white glossy prints, this saves us several steps in the processing.

ANOS Council — Annual General Meeting

This meeting was held at the Ryde School of Horticulture on Saturday, 9 August, 1980. The President's annual report is printed in full at page 218 of this issue, together with the financial statement of the Hon. Treasurer and the report of the Hon. Auditor. The new Council elected is shown at page 219 in "Who's Who". The meeting appointed Messrs P. Collin and L. Bradford as Election Returning Officers for 1980/1981 and Mr K. Osborn as Honorary Auditor.

Among topics discussed under general business was that of recent thefts from orchid collections in the Sydney area — notably from the Sydney Group's project at Taronga Park Zoo and from the orchid nursery of Wal and Jill Upton. Referring particularly to the latter, the President asked members to be watchful for evidence of the disposal of valuable plants recognisable as coming from this source. He stressed that any attempt to shield the thieves — for whatever reason — would be a misguided attitude since continuance of such thefts could only result in the closing of collections to the public and hence would "set back orchid growing generally for many years".

On the subject of the National Awards for native orchid species and hybrids, the meeting discussed a suggestion that some country groups may lack confidence in submitting entries. The consensus seemed to be that, in view of the high standard of native orchids known to be in country collections, any lack of confidence was quite unfounded. The reverse should be the case.

FEEDBACK AND FOLLOW-UP:

- **ANOS NATIONAL AWARDS** — for the best native species orchid and best hybrid orchid of the year. The conditions and standards for these awards were published (pp 162-164) in *The Orchadian* for March, 1980. Now that Spring is here and most of your orchids are showing their stuff, dig out that March issue and talk to your plants about it. Remember the awards are nation-wide and cover the whole year, not just Spring-show candidates. All ANOS Groups and Affiliates are participants, so your first step is to have your plant(s) judged at a monthly meeting *by ANOS standards.* If your plant is selected by your Group or Society, it will be photographed and the entry fee of $5 per class will be paid by the Group/Society. The awards are for excellence. They recognise the species and the hybrid of the year.
- **"Like it or not"**, wrote L.T. Nesbitt in our March, 1980 issue, **"terrestrial hybrids are coming !"** He referred specifically to crosses made by Harold Goldsack *(Pterostylis curta x P. nutans)* and by R.C. Nash *(P. baptistii x P. cucullata)* — both hybrids reputed to be easily cultivated and to have a high rate of vegetative increase. This is further evidence that there is always something new happening in the orchid world. In this case the happenings are in South Australia, and I report some of them in summary here as an indication of what is in store for readers in the future. In February, Bob Bates told me in a letter that at least five Adelaide growers are to the point of selective hybridisation — both interspecific and intergeneric — with Caladenia. Les Nesbitt had recently shown him a flask, three months old, containing at least 100 seedlings of *Glossodia major x Caladenia deformis* (possibly identical with a natural hybrid described as *C. tutelata* R.S. Rogers). Such a cross is clearly of both historical and botanical importance. Bob Bates himself is using the vegetatively increasing *C. latifolia* (red, pink and white) as a major parent in a number of crosses for hardiness and rapid increase. *C. patersonii* in some of its larger forms is another of his choice parents.
- In May I had a letter from R.C. Nash resulting from Les Nesbitt's article quoted above. I give you here the briefest summary of Mr Nash's hybridisation over the past seven years. In *Pterostylis,* eleven successful crosses (including two beyond the primary stage) and in *Diuris,* four primary hybrids have been made. Mr Nash has spare plants of the following: —

RN66 — *P. acuminata v. ingens x P. curta*
RN68 — *P. curta x P. nutans*
RN69 — *P. acuminata v. ingens x P. scabra v. robusta*
RN79 — *P. acuminata v. ingens x P. cucullata*

These he will swap for species of terrestrials he does not have or cool growing Dendrobiums. His address is: 77 Coromandel Parade, Blackwood, S.A. 5051.

Corrigenda — *The Orchadian* Vol. 6, No. 8, June, 1980:
p. 173 — Caption to first photograph should read *"Liparis habenarina".*
p. 180 — Captions to both illustrations should read — "enlarged" not "x 1".

A PRELIMINARY KEY TO THE SPECIES OF DENDROBIUM SECTION *OXYGLOSSUM*

by T.M. Reeve & P.J.B. Woods

28 May, 1980

A joint study of sections *OXYGLOSSUM* and *CUTHBERTSONIA* of the genus *DENDROBIUM* was commenced in late 1978 by the Department of Primary Industry, Papua New Guinea, and the Royal Botanic Garden, Edinburgh, Scotland. It is planned to produce a complete revision of both sections together with line illustrations and colour photographs which will make the work useful to botanists, collectors and growers. Good progress has been made and now a preliminary key and some notes on the species of section *OXYGLOSSUM* are being published in advance. This should provide helpful information until the final revision with delineation of subspecies and varieties is completed.

INTRODUCTION:

There are at least 96 published species names in section Oxyglossum. The collation of these names has involved a careful search through numerous publications and the examination of specimens in the herbaria of Lae, Bogor, Kew, Leiden, Edinburgh, British Museum, Paris, Brussels, Vienna and Zurich. Herbaria in Australia have yet to be visited. A list is given in the Appendix and it is probable that there are yet further names to be added.

Considerable confusion exists regarding the taxonomy of section Oxyglossum and some of the reasons for this are now discussed.

1. Probably the main cause for confusion in identification as well as duplication in naming has arisen because of the lack of appreciation of the variation which occurs within the species of this section. Firstly the plant form may vary considerably, especially at high altitude. This may well be caused by the great temperature variation in the alpine zone. For example, *Dendrobium brevicaule,* a common alpine species in New Guinea, shows a remarkable variation in plant form. If growing in deep shade (usually icy cold) with competition from large cushions of moss, the plants will be long and straggly (pendulous) with distinct rhizomes. On the other hand, if some plants are growing exposed to the full sunlight (which is burning hot at high altitudes), they will be compact and stunted, without rhizomes. That these different vegetative forms are mainly due to environmental factors has been proved by collecting them and growing them under uniform conditions at Laiagam.

Secondly, whilst the flowers are the best guide in identification, the numerous colour forms within a species have also created confusion. Some of the species in this section exhibit an amazing range of colour variation. This was not realised in the early days of collecting, so that sometimes botanists described new species on the basis of a different colour and the fact that it had been collected from a different part of New Guinea. For about half of the species in this section the colour is constant (as far as we know) and, where distinctive, use of this feature has been made in the key.

Thirdly, undue emphasis has been put on such features as the number of veins in the petals and sepals, the finely serrated edges of the tepals, the length of the mentum and the shape of its apex, and the size of the crests or keels on the lateral sepals. Studies at Laiagam have shown that these features are quite variable and even different flowers on the same plant show a variation in the number of veins in the tepals. The ovary cross-section has proved to be a fairly constant character and the size of the flowers is also quite a useful key character.

Whilst on these important points, a brief comment on the treatment of the alpine members of section Oxyglossum by Dr P. van Royen (1980) is appropriate. In our opinion, van Royen has failed to appreciate this variation and has described 16 new species in his recently published "The Alpine Flora of New Guinea". At the specific level we only recognise two of these as new, namely *D. habbemense* (Syn. *D. spathulatilabratum*) and *D. juncoideum.* (**Note:** This second species, *D. juncoideum,* we regard as better placed in section Pedilonum as it falls into a group with similarities to *D. hasseltii* and *D. kuhlii* from Java.)

2. Another reason for confusion in this group is due to the loss of all of Schlechter's holotype specimens which were destroyed in Berlin during the second world war. Rudolf Schlechter described more species in this section than any other botanist, and many descriptions were based on a single specimen. Fortunately there are some duplicates at Leiden, Kew, Edinburgh, Brussels, Paris, Ames (Harvard), Sydney, Vienna, British Museum, Zurich, Geneva, Stockholm, Bogor and possibly elsewhere as well.

3. A considerable amount of duplication in naming New Guinea orchids occurred due to "competition" by German, Dutch and British botanists describing the flora from different parts of the island. Many species of mountain orchids in New Guinea have a wide distribution from east to west throughout the Central Range. This, quite understandably, was not realised enough at the time. Also, some publication dates were so close and communication so slow that botanists were not able to consult each others' work before publishing their new descriptions.

4. Section Oxyglossum orchids are mainly mountain species and are difficult to grow outside their native habitats. Until recently there was no highland garden in New Guinea where these orchids could be grown and studied as living subjects. Of the overseas gardens, Edinburgh probably has had the best living collection of these orchids until recently. Established in 1975 the Highland Orchid Collection at Laiagam in the Enga Province, at 2200 metres above sea-level, with about two-thirds of all the known species and subspecies in cultivation, has greatly assisted this study.

This article does not contain proper lists of synonymy as this will best be left until the work in delineating subspecies and varieties is complete. Actually, names within section Oxyglossum have been so misapplied in the past that lists of synonyms will be of little help to most growers. However, for those who are interested, a tentative guide to synonyms is given in the Appendix.

Although this key has been tested against hundreds of specimens, both living and preserved, there will still be room for improvement. The authors would welcome any comments from those who use it and from anyone who may have useful information on this group of orchids.

SECTION *OXYGLOSSUM* Schltr. in K. Schum. et Laut. Nachtr. 149, 160 (1905) et in Fedde Rep. Beih. 1 : 446, 526 (1912).

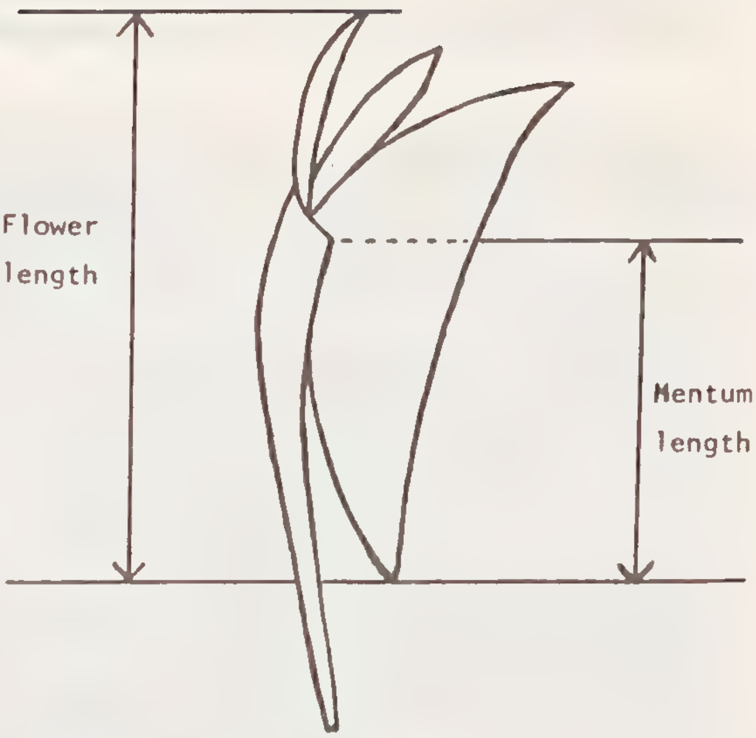
Small tufted herbs, sometimes creeping, rarely pendulous; epiphytic, sometimes terrestrial. Stems usually tapered with one to several leaves near the apex. Inflorescences usually few-flowered, commonly 1 – 3, arising from both leafy and leafless stems, usually near the apex. Flowers brightly coloured and long lasting (up to 10 months), often with a conspicuously coloured apex to the labellum. Sepals and petals acute to acuminate at apex (not obtuse as in section Cuthbertsonia). Labellum simple to subtrilobate, may or may not be saccate at the base, apex acute to acuminate. Ovary with ribs or wings.

Lectotype Species: *Dendrobium cyanocentrum* Schltr in K. Schum. et Laut. Nachtr. 160 (1905); chosen by van Royen in Alp. Fl. N.G. 2:363 (1980).

Distribution: Approximately twenty seven species from Celebes, Moluccas, New Guinea and its adjacent islands, Micronesia, Solomon Islands, New Hebrides and Fiji. Van Royan (1980) includes the Philippines in the distribution of this section but we could not find any evidence to confirm this.

General Notes: Some botanists have described the labella of species of this section as trilobate but we think that this term could be misleading. In our opinion it is best to regard the labella as simple or subtrilobate. Schlechter used the terms subtrilobate or obscurely trilobate which we think are more accurate.

Five of the twenty-seven species have characteristics which place them mid-way between sections Oxyglossum and Pedilonum. These are *D. petiolatum, D. undatialatum, D. lancilabium* and *D. habbemense.* When a fuller study is made of the genus it may well be that some of these species will be placed elsewhere. The divisions between sections **Cuthbertsonia, Oxyglossum, Pedilonum** and **Calyptrochilus** are not clear-cut.



Flower length is measured from the tip of the dorsal sepal to the apex of the mentum. Mentum length is measured from the junction of the ovary down, and is equal to the length of the column foot. i.e. It is not just the enclosed spur-like section near the apex of the mentum.

$$\text{Flower / mentum length ratio} = \frac{\text{Flower length}}{\text{Mentum length}}$$

KEY TO THE SPECIES

1a	Flowers predominantly bright orange; may be orange-red or orange-yellow	2
1b	Flower colour otherwise: red, pink, yellow, white, green, blue or purple	9
2a	Ovary cross-section 3-winged or dinstinctly triangular	3
2b	Ovary cross-section not 3-winged nor distinctly triangular (5 or more-winged, 5 or 6-ribbed or indistinctly triangular)	5
3a	Plants with stems up to 40 cm long, often pendulous; leaves ovate to oblong, usually slightly but abruptly narrowed above the middle, 1.2 – 2.8 x 0.4 – 1.4cm	*D. lancilabium*
3b	Plants otherwise; stems not pendulous	4
4a	Flowers over 2.2cm long	*D. vexillarius*
4b	Flowers less than 2.0cm long	*D. subacaule*
5a	Plants pendulous to semi-erect, stems thin near base and thickened towards apex, sometimes branched, up to 100cm long; floral bracts persistent; flowers usually borne singly, 2.2 – 4.0cm long	*D. habbemense*
5b	Plants otherwise; floral bracts not persistent	6
6a	Flowers over 2.8cm long; anther purple-black	*D. brevicaule*
6b	Flowers less than 2.8cm long (rarely to 3.2cm); anther not purple-black	7
7a	Leaves thick-textured, over 3.5mm broad; mentum apex obtuse	*D. puniceum*
7b	Leaves thin-textured, less than 3.5mm broad; mentum apex not obtuse; usually bilobed	8
8a	Flowers uniformly coloured, usually bright orange, 1.6 – 2.8cm long (rarely to 3.2cm)	*D. dekockii*
8b	Flowers not uniformly coloured (labellum green to black with orange apex), 0.8 – 1.7cm long	*D. theionanthum*
9a	Ovary cross-section 3-winged or triangular (if indistinct, try this lead first)	10
9b	Ovary 5-ribbed or with 5 or more wings	22
10a	Plants with stems up to 40cm long, often pendulous; leaves ovate to oblong, usually slightly but abruptly narrowed above the middle, 1.2 – 2.8 x 0.4 – 1.4cm	*D. lancilabium*
10b	Plants otherwise, stems not pendulous	11
11a	Flower/mentum length ratio greater than 3; flowers greenish-white in colour; only recorded from the mountains of Fiji	*D. prasinum*
11b	Flower/mentum length ratio less than 3	12
12a	Ovary strongly 3-winged and flower over 2.5cm long	13
12b	Ovary not strongly 3-winged, or if ovary strongly winged, then flower less than 2.5cm long	14
13a	Plants small, usually of creeping habit with rhizomes; pseudobulbs 0.5 – 2.0 x 0.3 – 0.7cm; leaves usually green on top, purplish underneath; flowers up to 3.3cm long, bright magenta purple; labellum with orange acuminate apex which is not recurved	*D. rupestre*
13b	Plants erect, 4 – 30cm tall, usually with tapering stems over 2.0cm long; leaves usually of uniform colour; flowers 2.5 – 5.0cm long, very variable in colour; labellum often darker with an orange-red apex which is usually recurved	*D. vexillarius*
14a	Flowers bright yellow or yellowish-green, 1.4 – 2.6cm long; labellum darker green with orange-red apex which is usually recurved	*D. sulphureum*
14b	Flowers not yellow nor yellowish-green	15
15a	Flower predominantly white, whitish-pink or whitish-violet	16
15b	Flower predominantly blue, purple or red	18
16a	Flowers pure white or almost so, 1.6 – 2.4cm long; petals obovate, over 3mm broad	*D. subuliferum*
16b	Flowers not wholly white, petals less than 3mm broad	17
17a	Flowers white to creamy-white, often striated and suffused with blue or violet, 1.0 – 1.6cm long; labellum brown, yellow or creamy-green; tepals often strongly reflexed, sometimes bent back parallel with ovary/pedicel	*D. cyanocentrum*
17b	Flowers whitish-pink with white mentum, approx. 1.8cm long; labellum golden-yellow with white apex; tepals not reflexed	*D. lapeyrouseoides*

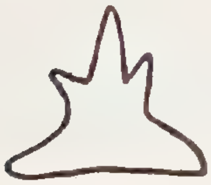
18a Plants creeping with distinct rhizomes; pseudobulbs globose to ovoid, usually 2-leaved, approx. 2 – 3mm diameter; leaves 4 – 12 x 1.5 – 2.5mm; flowers blue or bluish-violet, 1.2 – 1.5cm long; labellum apex orange-red . . . *D. putnami*
18b Plants without rhizomes, or (if with rhizomes) flowers over 1.6cm long . . . 19
19a Flower blue-violet to violet, approx. 1.4cm long; labellum with orange-red apex; leaves 1.5 – 3.5 x 0.2 – 0.4cm; only recorded from Ponape Island, Micronesia . . . *D. violaceo-miniatum*
19b Flower colour otherwise, or (if similarly coloured) more than 1.8cm long . . . 20
20a Leaves elliptic-lanceolate, less than 1.7cm long; flowers red or reddish-purple . . . *D. subacaule*
20b Leaves usually over 1.7cm long; flowers purple . . . 21
21a Leaves over 3mm broad; ovary strongly 3-winged; labellum apex orange . . . *D. rupestre*
21b Leaves less than 2mm broad, ovary indistinctly triangular; labellum apex scarlet . . . *D. nardoides*
22a Plants of creeping habit usually with distinct rhizomes; pseudobulbs small, globose to ovoid, sometimes clavate, 2-leaved; leaves ovate; flowers of variable colour, 0.8 – 1.5cm long; ovary 5-ribbed . . . *D. delicatulum*
22b Plants erect, tufted, without rhizomes . . . 23
23a Pseudobulbs 1-leaved (very rarely 2-leaved); leaves with distinct petiole, 3 – 15 x 1.0 – 3.5cm; inflorescences many flowered, usually with distinct peduncle; flowers bright magenta-purple, 1.4 – 2.1cm long; labellum apex orange; ovary with 5 or 6 wings which are not usually undulating . . . *D. petiolatum*
23b Plants otherwise; leaves not distinctly petiolate . . . 24
24a Pseudobulbs 1-leaved, sometimes 2-leaved; flowers whitish with orange-yellow markings on labellum, 1.1 – 1.6cm long; ovary wings strongly undulating; flower/mentum length ratio greater than 3 . . . *D. undatialatum*
24b Flower/mentum length ratio less than 3 . . . 25
25a Flowers over 1.7cm long . . . 28
25b Flowers less than 1.7cm long . . . 26
26a Flowers predominantly white, yellow or yellowish-green . . . 27
26b Flowers predominantly red or purple-violet . . . 34
27a Flowers white; labellum with orange or golden apex which is not recurved; lowland plant (below 1200m) . . . *D. masarangense*
27b Flowers yellow or yellowish-green (rarely white); upper part of labellum darker green with orange-red apex which is usually recurved; highland plant (above 1200m except in Eastern Papua) . . . *D. theionanthum*
28a Flowers over 2.8cm long; ovary strongly 5 or 6-winged, sometimes with extra smaller wings inserted between the larger wings . . . 29
28b Flowers less than 2.8cm long (if borderline check both leads) . . . 31
29a Flower greenish-white to yellow; labellum with bright orange apex . . . *D. pentapterum*
29b Flower colour otherwise . . . 30
30a Leaves less than 2mm broad . . . *D. cyperifolium*
30b Leaves over 2mm broad . . . *D. violaceum*
31a Leaves terete or subterete, less than 2.5mm broad; flowers pink to purple or blue with purple mentum (or rarely, yellow), 1.7 – 2.8cm long (rarely to 3.0cm); ovary 5-winged, the 3 dorsal wings usually close together, sometimes giving the appearance of the ovary being 3-winged . . . *D. hellwigianum*
31b Plants otherwise; leaves not terete nor subterete . . . 32
32a Pseudobulbs less than 2cm long . . . 34
32b Pseudobulbs tapering, over 2cm long . . . 33
33a Flowers usually widely opening; labellum apex bright orange; leaves not petiolate; root tips green . . . *D. pentapterum*
33b Flowers not widely opening; labellum apex not coloured bright orange; leaves sometimes tending to be petiolate; root tips orange . . . *D. nebularum*
34a Flowers dark violet with yellow labellum; mentum apex narrow and pointed; only recorded from the mountains of Ceram Island, Moluccas . . . *D. seranicum*
34b Flowers red to purplish-scarlet with orange labellum; mentum apex obtuse . . . *D. puniceum*

List of Species of Dendrobium Section Oxyglossum

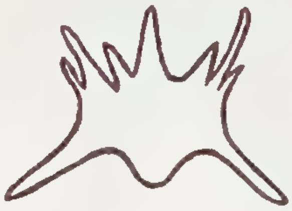
1 *Dendrobium brevicaule* Rolfe
2 *D. dekockii* J.J. Sm.
3 *D. masarangense* Schltr.
4 *D. theionanthum* Schltr.
5 *D. sulphureum* Schltr.
6 *D. nardoides* Schltr.
7 *D. subuliferum* J.J. Sm.
8 *D. cyanocentrum* Schltr.
9 *D. lapeyrouseoides* Schltr.
10 *D. violaceo-miniatum* Schltr.
11 *D. subacaule* Reinw. ex Lindl.
12 *D. rupestre* J.J. Sm.
13 *D. putnami* Hawkes et Heller
14 *D. delicatulum* Kraenzl.
15 *D. puniceum* Ridl.
16 *D. seranicum* J.J. Sm.
17 *D. violaceum* Kraenzl.
18 *D. hellwigianum* Kraenzl.
19 *D. cyperifolium* Schltr.
20 *D. pentapterum* Schltr.
21 *D. nebularum* Schltr.
22 *D. vexillarius* J.J. Sm.
23 *D. petiolatum* Schltr.
24 *D. undatialatum* Schltr.
25 *D. prasinum* Lindl.
26 *D. lancilabium* J.J. Sm.
27 *D. habbemense* van Royen

SOME OVARY CROSS SECTIONS (DENDROBIUM Section OXYGLOSSUM)

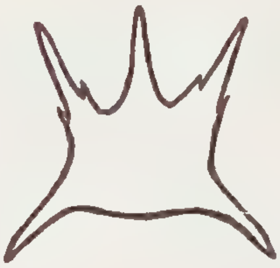
Drawn from living material at Laiagam except for *D. cyanocentrum* (from van Royen & Sleumer 5727 in L) and *D. prasinum* (from A.C. Smith 4170 in P) by T.M. Reeve. NOTE: The cross-section is best made at the top of the ovary near its junction with the column.



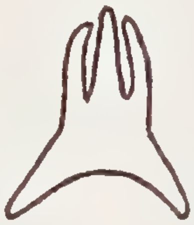
D. BREVICAULE



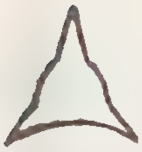
D. VIOLACEUM



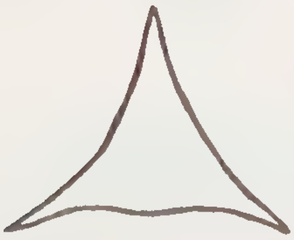
D. VIOLACEUM



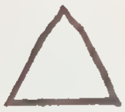
D. HELLWIGIANUM



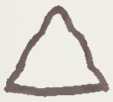
D. SUBACAULE



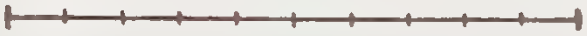
D. VEXILLARIUS



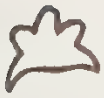
D. SULPHUREUM



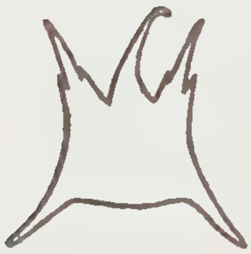
D. NARDOIDES



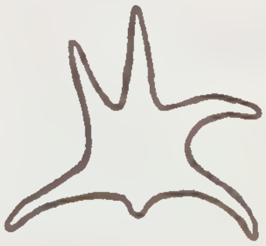
10 MILLIMETRES



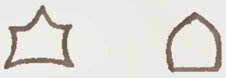
D. DELICATULUM



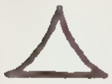
D. PENTAPTERUM



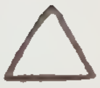
D. NEBULARUM



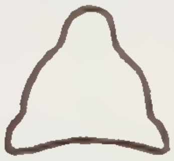
IONANTHUM



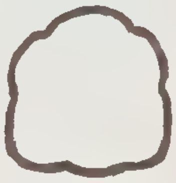
D. CYANOCENTRUM



D. PUTNAMI



D. PRASINUM



D. HABBEMENSE

NOTES ON THE SPECIES:

1. *Dendrobium brevicaule* Rolfe
in Kew Bulletin 110 (1899).

This species, one of the most striking in the section, has large brilliant orange flowers with characteristic purple-black anthers. The ovary is usually strongly 5-winged but sometimes less distinct forms are observed. The pedicel is often very elongated, and in some areas the crests on the lateral sepals are curiously spurred at the base. *D. brevicaule* is an alpine species occurring between 2900 and 3600 metres (occasionally up to 4000m), and is found on almost every high mountain in New Guinea. The plants may be small and tufted if growing in exposed positions (often with the leaves tinged purplish in colour), or may be long and straggly, with rhizomes, if growing in the shade.

Pseudobulbs: 0.4 — 10 x 0.2 — 0.7cm
Leaves: 1 — 8 x 0.3 — 1.2cm
Flowers: 2.8 — 5.0cm long (rarely shorter).
Cultivation: Unfortunately this beautiful species is very difficult to cultivate outside its natural habitat. Even at Laiagam (2200m) attempts to grow it have been largely unsuccessful to date.

2. *Dendrobium dekockii* J.J.Sm. in Bull. Jard. Bot. Buitenz. 2e (ii) : 14 (1911); in Nova Guinea 12 : 68, Tab. XVIII, 54 (1913).

This is another common alpine member occurring widely in New Guinea on its high mountains between 2900 and 3500m. The plants are small and tufted, and are commonly seen growing epiphytically on the native conifer *Dacrycarpus compactus* on grassland margins. The flowers are bright orange and the ovary 5-ribbed. It is readily distinguished from *D. brevicaule* by the smaller plants and flowers, and by the anther cap which is orange, not black, in colour.

Pseudobulbs: 0.2 — 2.5 x 0.1 — 0.6cm
Leaves: 1 — 6 x 0.1 — 0.3cm
Flowers: 1.6 — 2.8cm long (rarely to 3.2cm).
Cultivation: This is a difficult species to grow, requiring good air circulation, excellent drainage, high light intensity, high humidity and cold conditions. In New Guinea it is frost tolerant, but, like most of the other alpine epiphytes, a heavy frost will usually "burn" the leaves.

3. *Dendrobium masarangense* Schltr. in Fedde Rep. 10 : 78 (1911) et in Fedde Rep. Beih. 74 : Fig. 128 (1934).

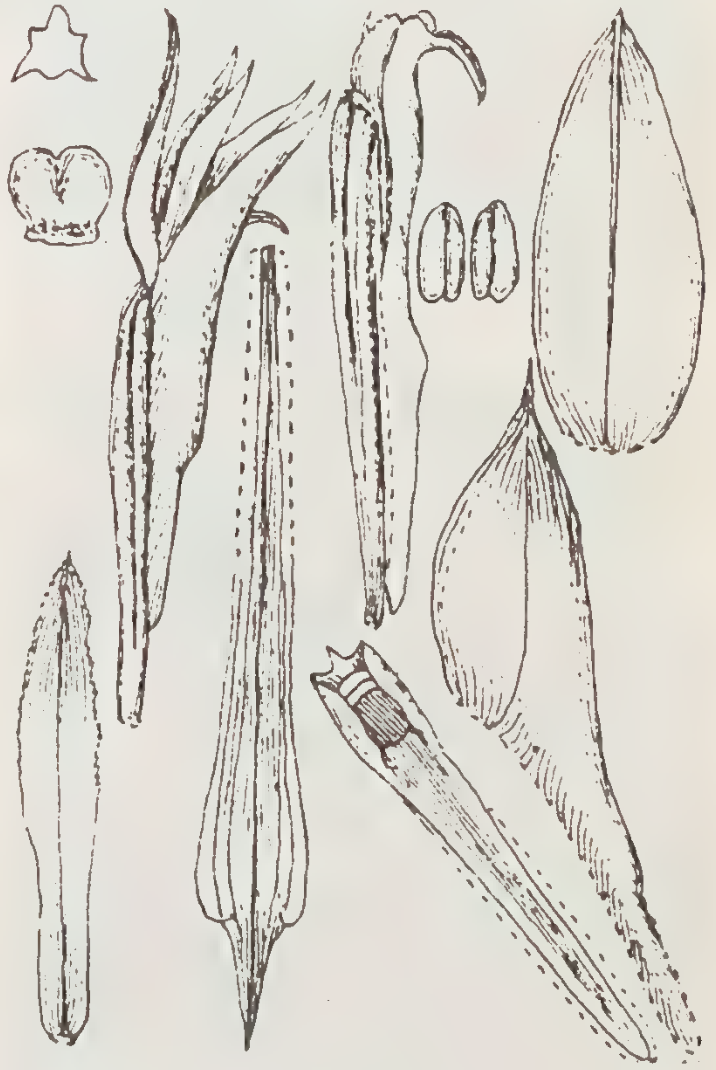
Originally described from the Celebes this species has a very wide distribution throughout lowland New Guinea, the Solomon Islands, and has also been collected on Erromanga in the New Hebrides by the late Dr J. Raynal of the Paris Herbarium. It has been collected between 300 and 1200m and is a very small tufted plant which might easily be overlooked when not in flower. The small flowers are white and the labellum has an orange or golden-yellow apex which is pointed and not recurved. The ovary is usually indistinctly 5-ribbed.

Pseudobulbs: 0.4 — 1.5 x 0.2 — 0.35cm
Leaves: 1.0 — 5.5 x 0.1 — 0.2cm
Flowers: 0.9 — 1.6cm long.
Cultivation: This species is little known in cultivation but it has been successfully grown in the orchid glasshouses associated with the Paris Herbarium (Muséum National D'Histoire Naturelle). Being a lowland species it should be fairly easy to grow in warm glasshouses.

4. *Dendrobium theionanthum* Schltr. in Fedde Rep. Beih. 1 : 528 (1912) et in Fedde Rep. Beih. 21 : Fig. 667 (1928).

This is a common and widespread species in New Guinea occurring between 1000 and 3000m. It is a small tufted plant commonly collected on small twigs and branches which are exposed to a fair amount of breeze. The common colour form is yellow to yellowish-green. The labellum is green towards the apex which is coloured orange-red and usually recurved. An apparently uncommon colour form is orange with a greenish-black labellum. White forms have also been found at high altitude and the differences between *D. masarangense* and *D. theionanthum* are small. The ovary is 5-ribbed with the lateral two ribs often very obscure. A variety with a very hairy ovary has been recorded from West New Guinea. (**Note:** In this article the term "West New Guinea" refers to the western half of the island which is presently called Irian Jaya.)

Pseudobulbs: 0.2 — 1.5 x 0.1 — 0.3cm
Leaves: 0.5 — 3.5 x 0.075 — 0.2cm (rarely to 0.35cm)
Flowers: 0.8 — 1.7cm long.
Cultivation: *D. theionanthum* grows well at Laiagam on tree-fern slabs but does require good air movement and excellent drainage and also prefers about 30% shade.



Dendrobium theionanthum Schltr.
from Schlechter's Figuren-Atlas (fig. 667)

5. *Dendrobium sulphureum* Schltr. in Fedde Rep. Beih. 1 : 534 (1912) et in Fedde Rep. Beih. 21 : Fig. 677 (1928).

Although Schlechter states that his type specimen came from 800m in the Torricelli mountains, this species is commonly found between 1800 and 3300m with a fairly wide distribution throughout the highlands of New Guinea. Three distinct subspecies are recognised, two of them occurring in the alpine zone with larger flowers 2.0 — 2.7 cm long. Subspecies *sulphureum* grows at lower altitudes (1800 — 2700m) with smaller flowers 1.4 — 2.2cm long, and was depicted on a Papua New Guinea postage stamp in 1969 (incorrectly labelled as *D. pseudofrigidum*). In all subspecies the flowers are bright greenish-yellow, and the labellum is green with an orange-red apex which is usually recurved. The ovary cross-section is usually triangular but may be indistinct making small plants sometimes difficult to distinguish from *D. theionanthum.* Although the flowers are identically coloured, the size of the flowers and plants of *D. sulphureum* are usually clearly larger than those of *D. theionanthum.* (**Note:** If the flowers are less than 1.7cm long, *D. sulphureum* may be recognised by having some pseudobulbs or leaves which are over 3mm broad.)

Pseudobulbs: 0.5 – 6 x 0.15 – 0.6cm
Leaves: 0.6 – 6 x 0.15 – 0.6cm
Flowers: 1.4 – 2.7cm long

Cultivation: The lower altitude subspecies grows well at Laiagam on pieces of tree-fern fibre, but the two alpine subspecies are more difficult to cultivate.

6. *Dendrobium nardoides* Schltr. in Fedde Rep. Beih. 1 : 529 (1912) et in Fedde Rep. Beih. 21 : Fig. 668 (1928).

This pretty, high altitude species grows between 2000 and 3200 metres and has only been recorded from the mountains of Papua New Guinea so far. It has a widespread distribution from Mt. Vinevo on Goodenough Island (Milne Bay Province) to the Star Mountains, and doubtless it occurs in West New Guinea as well. It is commonly found growing as an epiphyte embedded in cushions of moss and can form large clumps up to 30cm across. The flowers are a bright purple, although the mentum is sometimes whitish towards the apex. The labellum has a characteristic scarlet apex which is usually slightly recurved, and the ovary cross-section is triangular.

Pseudobulbs: 0.3 – 2.0 x 0.15 – 0.4cm
Leaves: 0.8 – 5.0 x 0.075 – 0.15cm
Flowers: 1.2 – 2.0cm long

Cultivation: This species grows well at Laiagam both in pots and on pieces of tree-fern fibre. It is necessary to clear away all the moss first to grow it successfully.

7. *Dendrobium subuliferum* J.J.Sm. in Bull. Jard. Bot. Buitenz. 2e (ii) : 15 (1911) et in Nova Guinea 12 : 63 Tab. XVII, 51 (1913).

This beautiful white-flowered species has only been collected a few times and it grows between 300 and 2000 metres. The collections examined all came from between 1200 and 2000m, but the type locality is given as "Mt. Goliath, West N.G. 300m". A later variety described by J.J. Smith also came from an altitude of 300m. Van Royen (1980) interprets this as 3000m and regards it as an alpine species. However, we do not think that the existing evidence warrants its inclusion as an alpine member. *D. subuliferum* has only been collected twice in Papua New Guinea* — near Telefomin in the West Sepik Province (2000m), and near Mumeng in the Morobe Province (1200m). The Telefomin collection was made by Mr E.E. Henty of the Lae Herbarium in 1964, and the field notes state that the flowers were fragrant. This is the only record of scent within this section of Dendrobium. The plants with subulate leaves resemble *D. nardoides* and *D. cyanocentrum*, but the flowers are usually larger with distinctive wide spathulate petals. The ovary cross section is triangular and the flowers are usually borne singly. (* **Late Note:** In April, 1980 this species was found growing between 1000 and 1500m in the Erave area of the Southern Highlands Province, Papua New Guinea. The flowers were pure white except for some red striations on the inside of the labellum and the anthers which were slightly violet in colour.)

Pseudobulbs: 0.5 – 2.5 x 0.15 – 0.35cm
Leaves: 1 – 4 x 0.1 – 0.2cm
Flowers: 1.5 – 2.4cm long

Cultivation: A single plant at the Royal Botanic Garden, Edinburgh was successfully grown for a number of years. Otherwise there is no record of this orchid in cultivation.

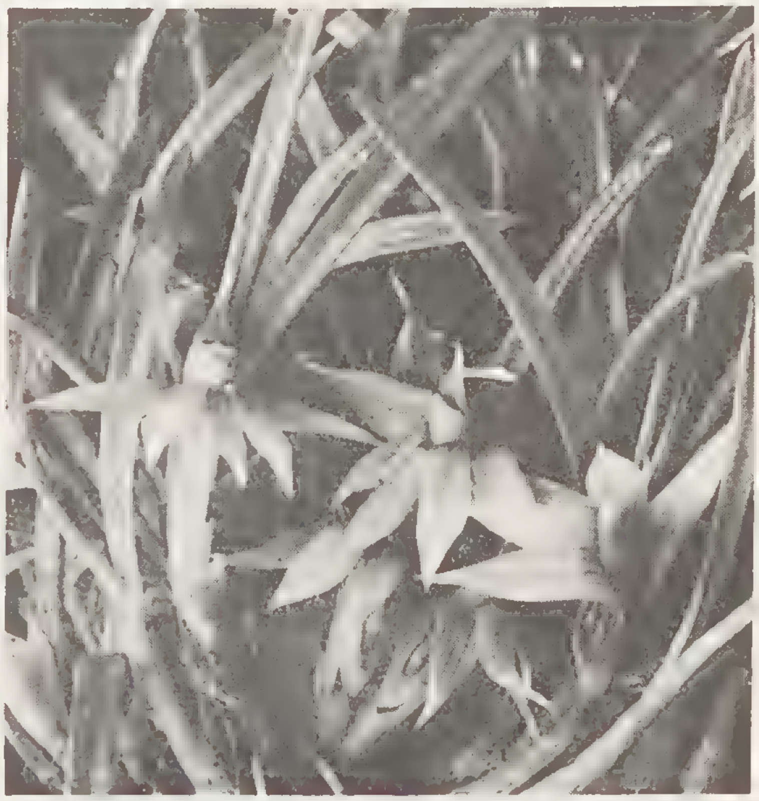
8. *Dendrobium cyanocentrum* Schltr. in K. Schum. et Laut. Nachtr. 160 (1905); in Fedde Rep. Beih. 1 : 527 (1912) et in Fedde Rep. Beih. 21 : Fig. 665 (1928).

Synonym *Dendrobium flavispiculum* J.J.Sm. in Fedde Rep. 12 : 120 (1913) et in Nova Guinea 12 : 333, Tab. CXX, 219 (1916).

This lowland member is the type species of section Oxyglossum and has been recorded from 100 up to 1300m with a wide distribution throughout New Guinea. The common colour form is white with violet-blue markings. The basic colour of the labellum varies from brown through yellow to greenish-cream and it is often streaked with purple veins. The anther cap is violet to blue. In West New Guinea a common colour form seems to be flowers with white tepals and a yellow labellum, and this variation was described as a new species, *D. flavispiculum*, by the Dutch botanist J.J. Smith. Hence there were two names commemorating different colour variations of the same species, and this example serves to show how unreliable colour can be in distinguishing New Guinea species of Dendrobium. A fairly characteristic feature of this species is the reflexed tepals which are often bent back parallel with the pedicel and ovary. The ovary cross-section is triangular or 3-winged.

Pseudobulbs: 0.5 – 2.5 x 0.15 – 0.4cm
Leaves: 1 – 6 x 0.1 – 0.25cm
Flowers: 1.0 – 1.6cm long

Cultivation: Being a lowland member of the section this species can be cultivated quite readily in warm glasshouses.



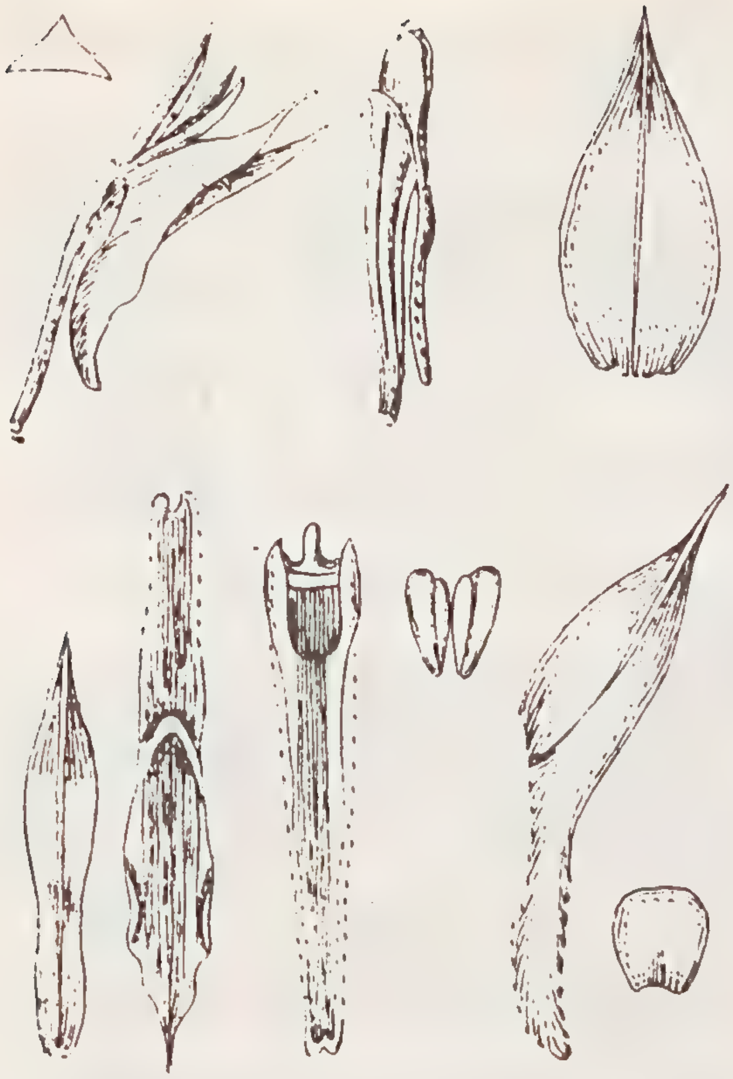
Dendrobium cyanocentrum Schltr.: The type specimen of section *Oxyglossum.* Photo: T.M. Reeve

9. *Dendrobium lapeyrouseoides* Schltr. in Fedde Rep. Beih. 1 : 530 (1912) et in Fedde Rep. Beih. 21 : Fig. 670 (1928).

This is the only species of which we have not seen any specimens. It is known only from Schlechter's description and figure, the single specimen having been destroyed when the Berlin Herbarium was bombed in 1943. It is quite similar to *D. cyanocentrum* and further collections may prove it to be conspecific with that species. However, for the present time it is being kept separate. It has a larger flower than *D. cyanocentrum* and the colour is different. The flower is whitish rose with white mentum, and the labellum is golden-yellow with a white apex. The tepals are not reflexed. Schlechter's specimen was collected in the Finisterre Range, Madang Province at an altitude of 1000m.

Pseudobulbs: 1.0 – 1.5 x 0.2 – 0.3cm
Leaves: 3.5 – 4.5 x 0.15 – 0.25cm
Flowers: Approx. 1.8cm long

Cultivation: Nothing is known but probably the same comments as for *D. cyanocentrum* apply.



Dendrobium lapeyrouseoides Schltr.
from Schlechter's Figuren-Atlas (fig. 670)

10. *Dendrobium violaceo-miniatum* Schltr. in Engl. Bot. Jahrb. 56 : 470 (1921).

This species is known only from Ponape in the Caroline Islands group of Micronesia and grows there between 200 and 650m so can be classified as a lowland member of the section. Ponape (formerly known as Ascension Island) is nearly 7 degrees north of the equator and approximately due north of Bougainville Island. *D. violaceo-miniatum* is a small tufted epiphyte with pretty bluish violet or violet flowers. The labellum is brick-red or orange and the ovary has a triangular cross-section.

Pseudobulbs: 0.4 – 1.5 x 0.1 – 0.25cm
Leaves: 1.0 – 3.5 x 0.2 – 0.4cm
Flowers: Approx. 1.4cm long
Cultivation: Nothing is known about the cultivation of this interesting species but it should do well in warm glasshouses.

11. *Dendrobium subacaule* Reinw. ex Lindl. in Journ. Linn. Soc. Bot. 3 : 11 (1859).

D. subacaule was first collected on the mountains of Tidore (Soaisu) Island in the Moluccas by Reinwardt who gave it a manuscript name. It was later published by the famous English botanist, John Lindley, and together with *D. prasinum* was the first species of section Oxyglossum to be described. It occurs throughout New Guinea and was described several times under different names by later botanists. Only H.N. Ridley recognised collections from Dutch New Guinea (Boden Kloss specimens) as being identical with *D. subacaule*. It has also been collected on Guadalcanal in the Solomon Islands. The dwarf tufted plants with short lanceolate leaves grow between 800 and 2200m and have brilliant red flowers. Orange as well as purplish-red forms have been recorded but the labellum is always orange to golden yellow. This species usually grows on small twigs and branches and despite its small size presents a very striking sight when in full flower. The ovary is 3-winged.

Pseudobulbs: 0.4 – 1.5 x 0.1 – 0.35cm
Leaves: 0.4 – 1.6 x 0.1 – 0.55cm
Flowers: 0.9 – 1.8cm long
Cultivation: This is a difficult species to grow and must have plenty of air movement and good drainage. At Laiagam it does best high up on posts.

12. *Dendrobium rupestre* J.J. Sm. in Bull. Jard. Bot. Buitenz. 2e (ii) : 15 (1911) et in Nova Guinea 12 : 64, Tab. XVII, 52 (1913).

The type specimen, found growing on a mossy limestone rock (hence the latin name *rupestre* = rock dwelling), was collected at an altitude of 3800 metres on Mt. Goliath in West New Guinea by A.C. de Kock in 1911. It is a widespread species in the mountains of New Guinea and is commonly found between 1500 and 3000m and, occasionally above. *D. rupestre* has a creeping habit and is often collected on fallen branches of *Nothofagus* (Beech) trees. Sometimes it is found growing as a terrestrial or as a lithophyte embedded in moss. The form of the plant varies from small compact clumps (in exposed positions) to straggly plants with elongated rhizomes and larger leaves (in shaded habitats with competition from mosses). The bright purple flower with an orange, acuminate, unbent apex to the labellum is quite distinctive. The leaves are usually green on top and purplish underneath and the ovary is 3-winged.

Pseudobulbs: 0.5 – 2.0 x 0.3 – 0.7cm
Leaves: 0.7 – 4.5 x 0.3 – 1.4cm
Flowers: 1.8 – 3.3cm long
Cultivation: At Laiagam *D. rupestre* has proved difficult to grow on tree-fern slabs but has been grown successfully on posts of Beech (*Nothofagus*).

13. *Dendrobium putnami* Hawkes et Heller in Lloydia 20 : 122 (1957).

Synonym *Dendrobium coerulescens* Schltr. in Fedde Rep. Beih. 1 : 531 (1912) et in Fedde Rep. Beih. 21 : Fig. 671 (1928) – non Wall. ex Lindl. (1835).

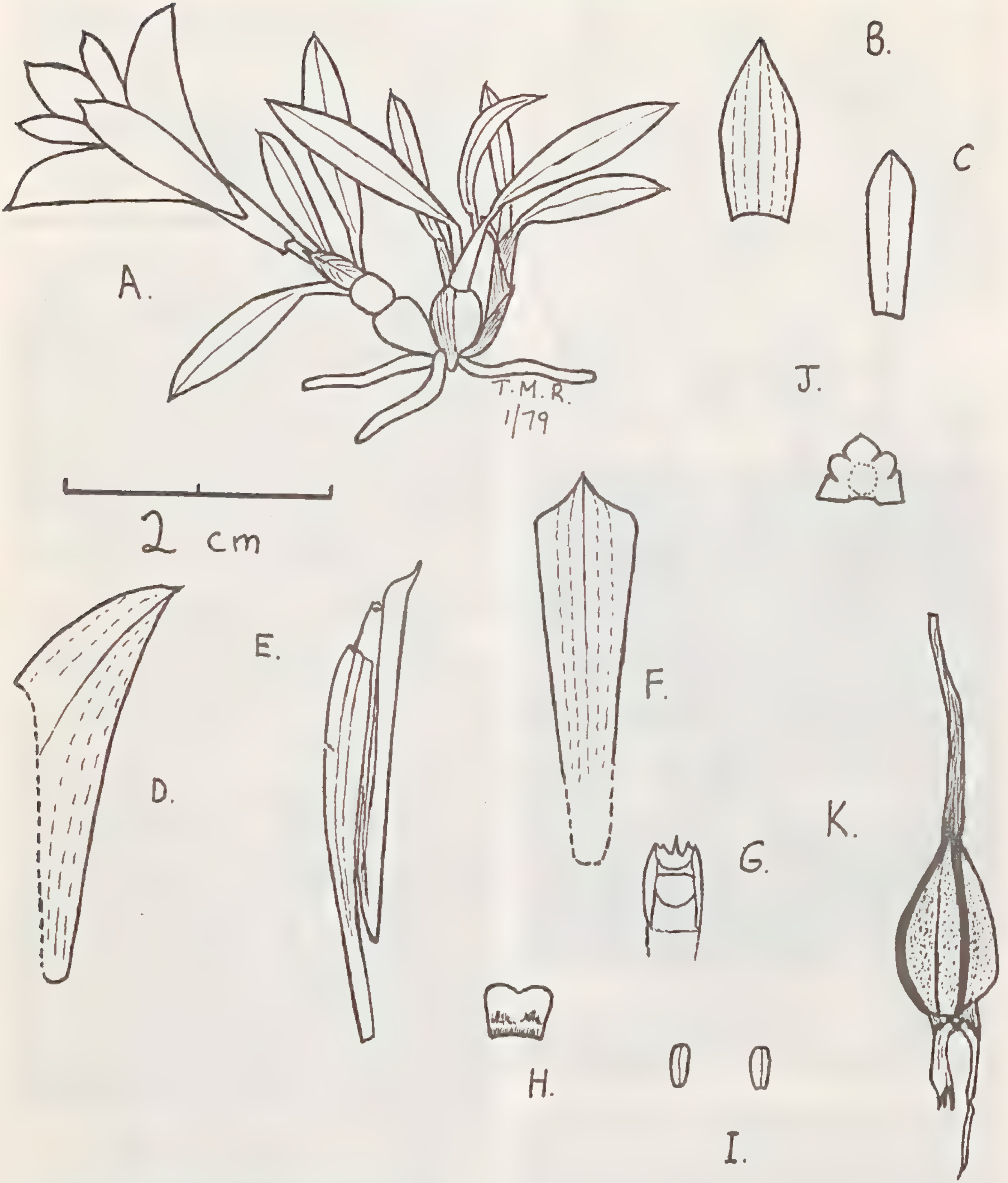
This uncommon blue-flowered orchid is known only from a few collections in the mountains of Papua New Guinea. Schlechter's collection at 800 metres must have come from a cold pocket in the Torricelli mountains as recent collections in the Enga, Western Highlands and Eastern Highlands Provinces have all been between 2000 and 3000m. (**Note:** The same comment also applies to *D. sulphureum*.) The plant has a creeping habit, usually with distinct rhizomes, and forms mats which grow on the trunks and branches of trees and can become quite large. The flowers are a beautiful blue, sometimes tinged violet, with an orange-red apex to the labellum. The ovary cross-section is triangular. Non-flowering plants are distinguished from *D. delicatulum* by the linear-lanceolate (not ovate) leaves.

Pseudobulbs: 0.2 – 0.7 x 0.2 – 0.4cm
Leaves: 0.4 – 1.2 x 0.15 – 0.25cm
Flowers: 1.2 – 1.5cm long
Cultivation: *D. putnami* grows quite well at Laiagam on posts or pieces of tree-fern fibre. However, it does not flower readily like other members of this section. It seems unusual that even in nature flowers are rarely observed.

14. *Dendrobium delicatulum* Kraenzl. in Engl. Bot. Jahrb. 16 : 17 (1893).

This dwarf creeping orchid has small flowers which may be purple, blue, red or yellowish-white in colour and it is a magnificent sight to see the trunk of a tree covered with this plant in full flower. The blue colour form is

DENDROBIUM DEKOCKII J.J. Sm.



Drawn from living material collected on
Mt. Michael, Eastern Highlands Province, P.N.G.
by T.M. Reeve

A	Plant
B	Dorsal sepal
C	Petal
D	Lateral sepal
E	Pedicel / ovary / column / labellum
F	Labellum
G	Column
H	Anther cap
I	Pollinia
J	Ovary cross-section
K	Fruit

A, K to indicated scale; B-G to scale X 3/2; H-J to scale X 5/2.

particularly beautiful. The ovary is distinctly 5-ribbed and the small ovoid to globose, sometimes clavate, pseudobulbs each bear two ovate leaves at the apex. Usually the rhizomes are distinct. Three subspecies can be recognised and will be the subject of a subsequent paper. The typical subspecies, which has an orange, reflexed labellum apex, occurs between 600 and 2300m, and it has a wide distribution throughout New Guinea and its adjacent islands. It also occurs on the island of Ponape (Micronesia). One subspecies occurs in the Celebes (Indonesia), whilst a third, from the highlands of Papua New Guinea, has yet to be described.

Pseudobulbs: 0.2 – 1.5 x 0.2 – 0.7cm
Leaves: 0.3 – 1.5 x 0.2 – 0.8cm
Flowers: 0.8 – 1.5cm long
Cultivation: Once established this orchid has proved relatively easy to grow at Laiagam. It does well on posts as well as on slabs of tree-fern fibre.

15. *Dendrobium puniceum* Ridl. in Journ. Bot. 24 : 324 (1886).

This species is found throughout New Guinea as well as in New Britain and the Solomon Islands between 400 and 1500m. It varies from orange through red to purplish-red in colour and the labellum is usually orange or occasionally golden-yellow. The ovary has 5 main wings but sometimes there are other smaller wings present as well. The thick leaves of this plant are distinctive and the mentum apex is obtuse.

Pseudobulbs: 0.4 – 2.0 x 0.2 – 0.7cm
Leaves: 1.2 – 4.7 x 0.3 – 1.0cm
Flowers: 1.4 – 2.2cm long
Cultivation: Nothing is known about the cultivation of this species.

16. *Dendrobium seranicum* J.J. Sm. in Bull. Jard. Bot. Buitenz. Ser. iii, 10 : 150 (1928).

D. seranicum is only known from the type collection of Prof L. Rutten made in Ceram Island, Moluccas in June 1918. According to Rutten's field notes it grows in the mountains there between 1000 and 1900m. The plants and flowers look intermediate between *D. hellwigianum* and *D. puniceum* but until more information is available on the flora of Ceram Island, it will be left as a distinct species. The flowers are dark violet in colour and the labellum is yellow. The ovary is 5-winged and the three dorsal wings are close together as in the flowers of *D. hellwigianum.*

Pseudobulbs: 0.5 – 1.5 x 0.2 – 0.6cm
Leaves: 1.2 – 4.0 x 0.15 – 0.4cm
(**Note:** The leaf measurements given in the published description do not match the type material examined. The actual measurements of the type are given above.)
Flowers: 1.6 – 2.0cm long
Cultivation: Nothing is known about growing this species but possibly the same comments as for *D. violaceum* and *D. hellwigianum* may apply.

17. *Dendrobium violaceum* Kraenzl. in Engl. Pflanzenr. Heft 45 : 108 (1910).

This variable species has been described several times under different names and occurs throughout New Guinea between 1000 and 2000m. However, like most species in this section, it is usually only encountered in certain localities where it is quite common. For example, *D. violaceum* is common in parts of the Milne Bay Province (the type locality) and in the Telefomin – Tari – Porgera area towards the border between Papua New Guinea and Irian Jaya. The flowers vary in colour from pink to deep violet and the labellum apex is orange and not recurved. There is also a nice form which has the petals and upper parts of the sepals coloured blue. The flowers are large, usually widely opening, and the ovary has 5 or 6 large wings, sometimes with smaller wings between the main ones. These wings may or may not be undulating.

Pseudobulbs: 1 – 5 x 0.5 – 1.5cm
Leaves: 5 – 30 x 0.2 – 1.1cm
Flowers: 2.8 – 4.5cm long
Cultivation: *D. violaceum* grows readily on pieces of tree-fern or in pots and prefers about 30% shade at Laiagam. It also does well in the full morning sun with no shade at all.

18. *Dendrobium hellwigianum* Kraenzl. in Engl. Bot. Jahrb. 16 : 16 (1893).

This species and *D. cyperifolium* have long terete or subterete leaves which distinguish them from other species in the section. It is a very widespread species in New Guinea growing between 1500 and 2700m. The type specimen from 2000m in the Finisterre Range was collected by Hellwig in 1888. Hellwig was one of the earliest collectors to venture into the highlands of German New Guinea. Several colour forms have been recorded – pink through to purple is common, as also is the form with blue petals and upper parts of the sepals. However, the yellow colour form is uncommon. In all of these colour variations the unrecurved labellum apex is a constant orange. The ovary is 5-winged with the dorsal 3 wings close together: sometimes so close that the ovary appears to be triangular in cross-section.

Pseudobulbs: 1 – 8 x 0.2 – 0.6cm
Leaves: 1.5 – 15 x 0.1 – 0.25cm
Flowers: 1.7 – 2.8cm long (rarely to 3.0cm)
Cultivation: Within section Oxyglossum this species has proved to be one of the easiest to grow at Laiagam so it should have a chance of doing well overseas in cool glasshouses. It is very floriferous and the flowers last many months. *D. hellwigianum* does best on tree-fern.

19. *Dendrobium cyperifolium* Schltr. in Engl. Bot. Jahrb. 58 : 108 (1923).

D. cyperifolium is very similar to *D. hellwigianum* but generally the leaves are longer and slightly narrower. The flowers are considerably larger but further collections and study may show this to be just a lower altitude variety or subspecies of *D. hellwigianum* or maybe a narrow leaved variety of *D. violaceum.* The type collection (by C. Ledermann in 1912-1913) as well as later collections by R.D. Hoogland and L.A. Craven in 1966, all come from the Hunstein Range in the East Sepik Province and it is hoped that a visit can soon be made to that area to collect living material. It has also been collected in West New Guinea, and its altitudinal range is from 1200 to 1800m. The flowers are purple in colour with an orange apex to the labellum.

Pseudobulbs: 1 – 4 x 0.3 – 0.5cm
Leaves: 8 – 20 x 0.075 – 0.16cm
Flowers: 2.8 – 4.5cm long
Cultivation: Nothing is known but presumably the same comments as for *D. hellwigianum* apply here also.

20. *Dendrobium pentapterum* Schltr. in Schum. et Laut. Nachtr. 161 (1905); in Fedde Rep. Beih. 1 : 539 (1912) et in Fedde Rep. Beih. 21 : Fig. 683 (1928).

Rudolf Schlechter described this orchid following his first visit to Kaiser Wilhelm's Land (German New Guinea) in 1901-1902. So far it has not been recorded from Papua (former British New Guinea) nor from the western half of the island (former Dutch New Guinea). It grows between 800 and 2000m, and claims that this species occurs in the alpine zone (Mansfeld 1929; van Royen 1980) are almost certainly based on misidentifications. For example, **Brass** 10529 (cited by van Royen) from near Lake Habbema in West New Guinea has been examined and is in fact a typical specimen of *D. vexillarius. D. pentapterum* is locally abundant in certain areas such as the Jimmi Valley but apart from the several early collections by Schlechter, it is poorly represented in herbaria. The flowers are greenish-white to yellow and the labellum has a bright orange apex which is not recurved. The ovary is 5-winged, often with smaller wings between the main ones.

Pseudobulbs: 1.5 – 5 x 0.4 – 0.8cm
Leaves: 2 – 9 x 0.4 – 1.1cm
Flowers: 2.0 – 3.5cm long
Cultivation: This species grows well at Laiagam in pots or on pieces of tree-fern fibre.

21. *Dendrobium nebularum* Schltr. in Fedde Rep. Beih. 1 : 540 (1912) et in Fedde Rep. Beih. 21 : Fig. 684 (1928).

Although poorly represented in herbarium collections, *D. nebularum* does occur widely in New Guinea and is also recorded from Ceram Island in the Moluccas. There are two colour forms recorded so far – greenish-white to yellow (sometimes striated with purplish-red veins), and dark red to reddish-purple. The new leaf sheaths are often striated with red veins and the root tips are orange. When not in flower the plants resemble the common *D. vexillarius*, but the 5-winged ovary (often with undulating wings) and the not widely-opened flowers clearly distinguish it from that species. It is never collected in abundance and is usually found as an epiphyte on *Nothofagus* (Beech) trees between 1500 and 2800m. Sometimes the leaves are petiolate but not as distinctly as in *D. petiolatum.*

Pseudobulbs: 3 – 20 x 0.3 – 1.2cm
Leaves: 1.5 – 13 x 0.3 – 2.3cm
Flowers: 2.0 – 2.7cm long
Cultivation: *D. nebularum* grows well at Laiagam both in pots and on pieces of tree-fern fibre.

22. *Dendrobium vexillarius* J.J. Sm. in Bull. Dep. Agr. Ind. Neerl. 39 : 12 (1910) et in Nova Guinea 8 : 575, Tab. XCVIA (1911); 14 : 424 (1929).

This is a very variable species recorded from 1200 to 4000m (commonly 1800 to 3200m) and is undoubtedly the most common species of the section in New Guinea. In 1975 it was also discovered growing on the Hans Meyer Range in New Ireland by an expedition from the Royal Botanic Gardens, Kew. We propose to divide this species into a number of subspecies and perhaps varieties as well. The various forms and subspecies include every colour of the rainbow as well as white and silvery-grey. The flowers are large and rendered more striking by the usually darker labellum which is tipped orange-red. The ovary is 3-winged or strongly triangular in cross-section.

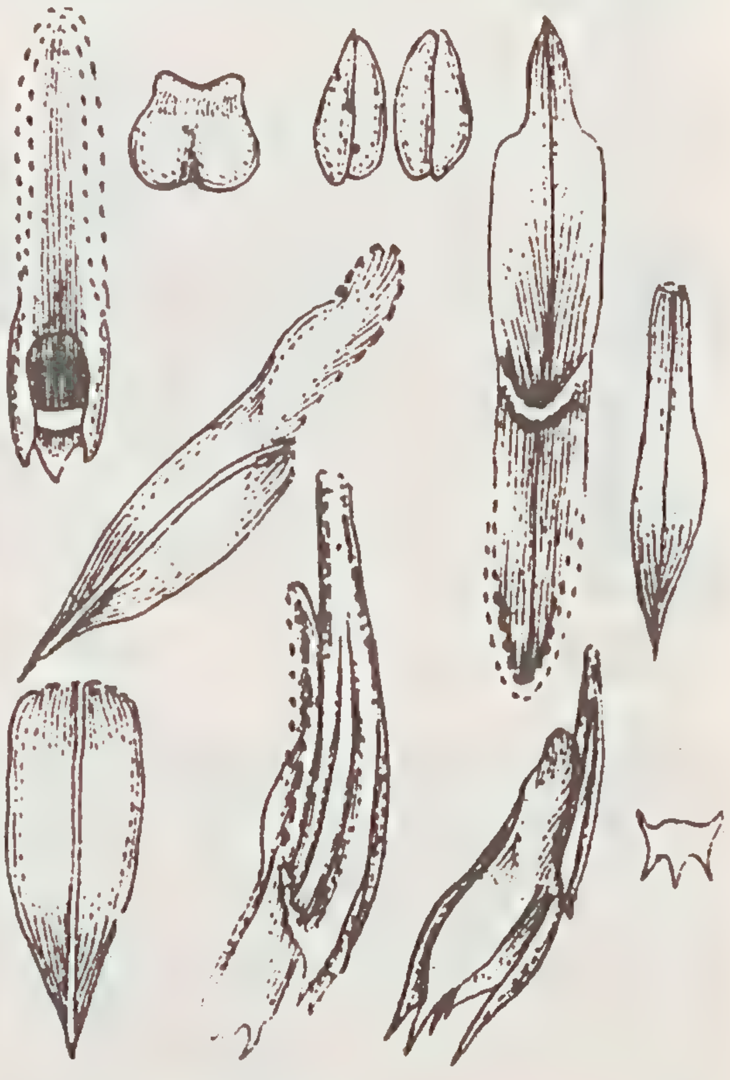
Pseudobulbs: 1.5 – 30 x 0.3 – 1.5cm
Leaves: 1.5 – 16 x 0.3 – 1.8cm
Flowers: 2.5 – 5.0cm long (rarely less than 2.5cm)
Cultivation: *D. vexillarius* grows well at Laiagam both on tree-fern fibre and in pots. The flowers last many months and some plants produce flowers several times a year so that they are almost permanently in flower. With continued selection for more adaptable varieties which are easy to grow overseas, this species has great potential as a cultivated orchid in cool climates.

Dendrobium vexillarius J.J. Sm.: One of the largest *Oxyglossum* species. Photo: T.M. Reeve

23. *Dendrobium petiolatum* Schltr. in Fedde Rep. Beih. 1 : 541 (1912) et in Fedde Rep. Beih. 21 : Fig. 686 (1928).

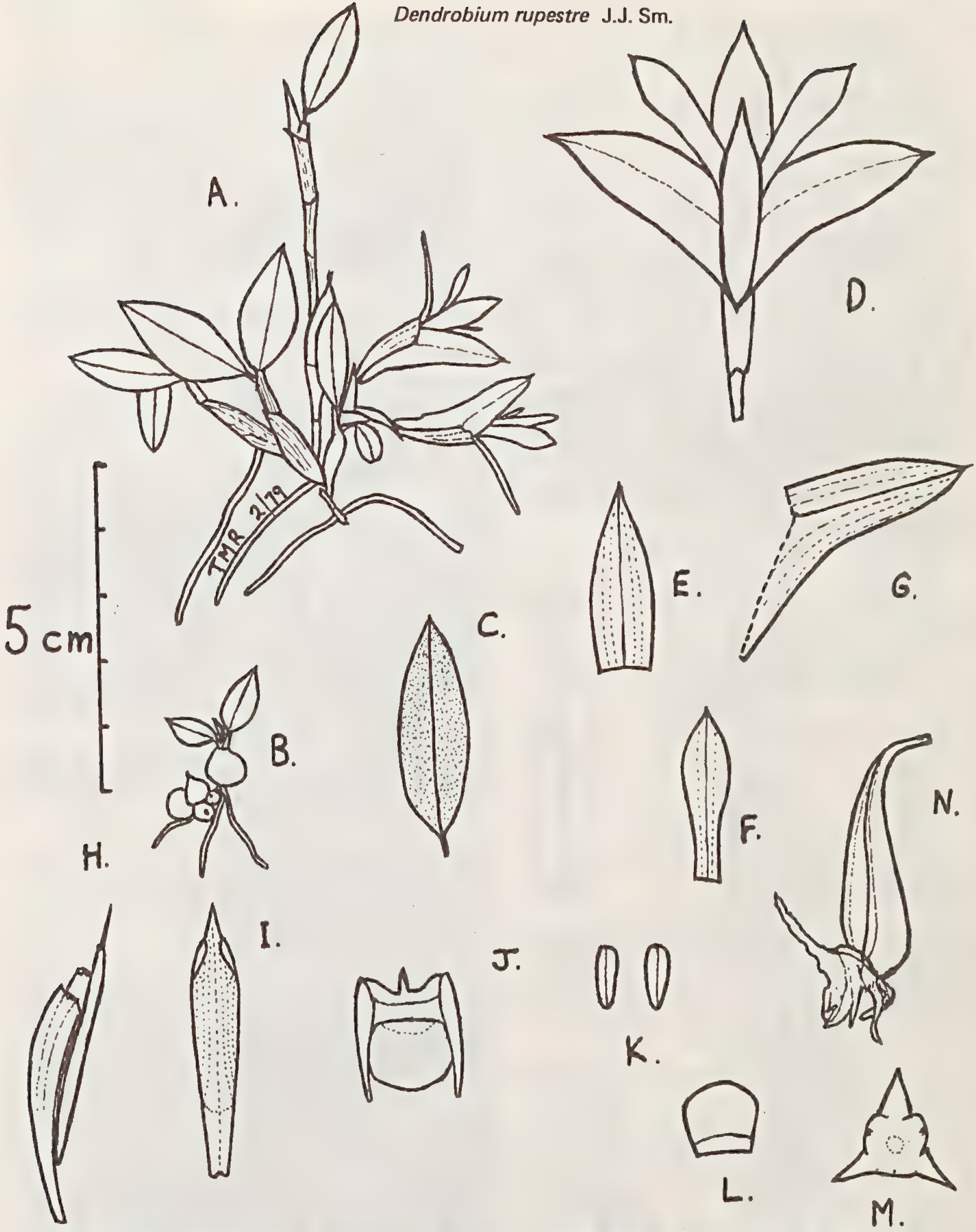
This species has dense racemes of flowers in the same manner as many members of section Pedilonum. The large petiolate leaves borne singly on each stem and the closely packed bright purple flowers (usually with a distinct peduncle) are characteristic of *D. petiolatum.* The labellum apex is orange and the ovary has 5 or 6 ribs or wings. So far this species has been recorded only from a few localities in Papua New Guinea including New Britain in the Bismarck Archipelago, and grows between 800 and 2400 metres. In contrast to most species in this section it is often found growing embedded in cushions of moss in deep shade.

Pseudobulbs: 0.5 – 4 x 0.5 – 1.6cm
Leaves: 3 – 15 x 1.0 – 3.5cm
Flowers: 1.4 – 2.1cm long
Cultivation: This is not an easy species to grow and does best on posts and pieces of tree-fern at Laiagam.



Dendrobium petiolatum Schltr.
from Schlechter's Figuren-Atlas (fig. 686)

Dendrobium rupestre J.J. Sm.



Drawn from living material collected on Mt. Iambari, Paiela, Enga Province, P.N.G., by T.M. Reeve

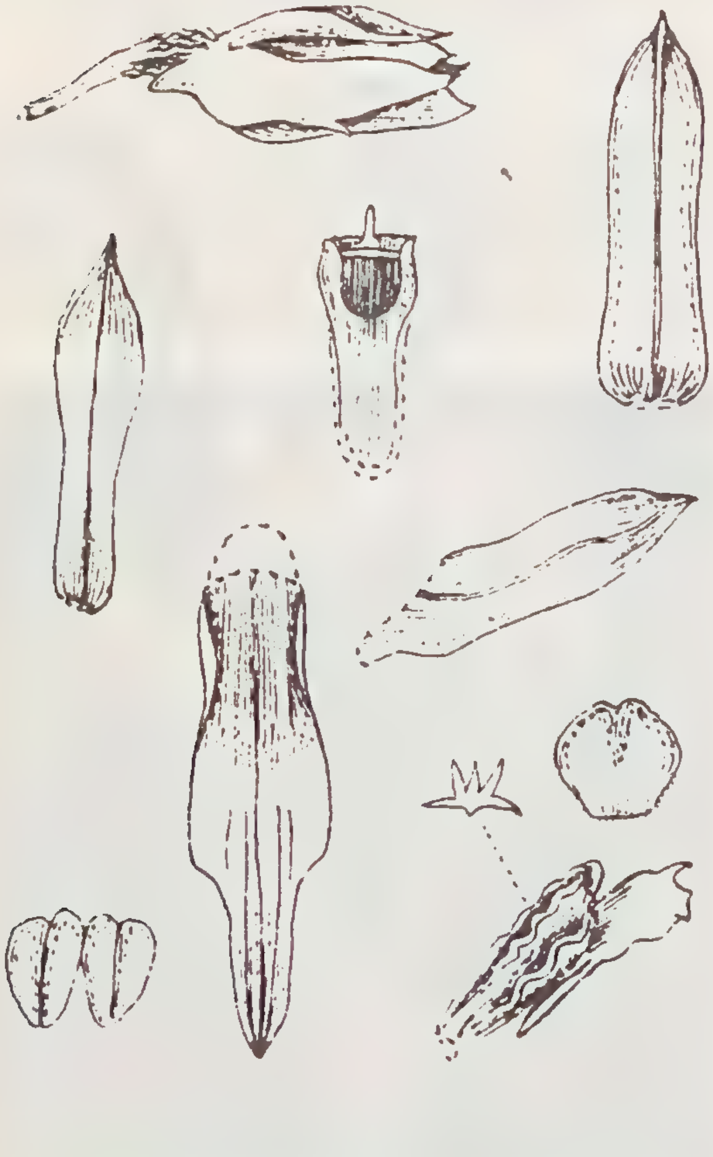
A	Plant from shaded habitat	H	Pedicel / ovary / column / labellum
B	Plant from exposed position	I	Labellum
C	Large leaf	J	Column
D	Flower	K	Pollinia
E	Dorsal sepal	L	Anther cap
F	Petal	M	Ovary cross-section
G	Lateral sepal	N	Fruit

A-C to indicated scale; D-I X 2; J-M X 6; N X 3/2.

24. *Dendrobium undatialatum* Schltr. in Fedde Rep. Beih. 1 : 542 (1912) et in Fedde Rep. Beih. 21 : Fig. 687 (1928).

Since the several collections by Schlechter this species has been recorded only twice.* In 1954 it was collected in the Milne Bay Province, Papua New Guinea by N.E.G. Cruttwell, and in 1965 P.F. Hunt collected it on Kolombangara Island in the former British Solomon Islands Protectorate. It occurs between 700 and 1300m which is a zone much neglected by botanists in New Guinea since the visits by Schlechter. It is noteworthy that most botanical expeditions usually climb some high mountain or collect near the coast, and as a result the orchid flora of the lower mountains of New Guinea, between 500 and 1500m, is relatively poorly represented in herbarium collections. Superficially this species resembles a small plant of *D. purpureum.* This is shown by the fact that **Schlechter** 16092 in Kew contains a mixed collection of both *D. undatialatum* and *D. capituliflorum* (the latter known as *D. purpureum*). The flowers are white and the labellum has orange-yellow markings, sometimes with purplish-red striations. The ovary is 5 or 6-winged. The strongly undulating ovary wings together with the very short mentum are very distinctive. (***Late Note:** In April 1980 this species was discovered growing near Erave in the Southern Highlands Province, Papua New Guinea, at 1100m).

Pseudobulbs: 1.0 – 3.5 x 0.3 - 0.7cm
Leaves: 1.5 – 9 x 0.6 – 2.2cm
Flowers: 1.1 – 1.6cm long
Cultivation: Nothing is known about the cultivation of this uncommon species.



Dendrobium undatialatum Schltr.
from Schlechter's Figuren-Atlas (fig. 687)

25. *Dendrobium prasinum* Lindl. in Journ. Linn. Soc. Bot. 3 : II (1859).

Known only from the mountains of Viti Levu, Fiji, *D. prasinum* grows between 700 and 1150m. In appearance this plant is similar to *D. laevifolium* Stapf of section Cuthbertsonia. However, *D. prasinum* differs in the pointed (not obtuse) tepals and labellum, the ovary triangular in cross-section and the very short mentum. The flowers are also different in colour, being greenish-white or yellowish-white. Growing further south this species probably has a more definite flowering season — at least all the collections seen in herbaria were made between April and September.

Pseudobulbs: 1 – 4 x 0.5 – 1.3cm
Leaves: 2.5 – 14 x 0.5 – 1.4cm
Flowers: 2.2 – 3.0cm long
Cultivation: Nothing is known about the cultivation of *D. prasinum* and we would welcome information from orchid growers in Fiji.

26. *Dendrobium lancilabium* J.J. Sm. in Engl. Bot. Jahrb. 66 : 198 (1934).

This little-known species occurs in West New Guinea between 1500 and 2000m and was recorded as being common in parts of the Vogelkop by P. van Royen and H. Sleumer who collected there in 1961. Although the plants are atypical (with pendulous canes seen more in sections Calyptrochilus and Pedilonum), the shape of the flowers places this species in section Oxyglossum. The tips of the tepals and labellum are acuminate and the lateral sepals are curved through a 90 degree angle with the tips pointing forward. The shape of the leaves is also distinctive, being ovate-oblong and slightly but abruptly narrowed above the middle. The ovary cross-section is triangular and the large flowers are red to orange-red in colour.

Pseudobulbs: 5 – 30cm long (only 3 specimens seen)
Leaves: 1.2 – 2.8 x 0.4 – 1.4cm
Flowers: 2.8 – 3.7cm long
Cultivation: Nothing is known about the cultivation of this species but possibly it would be the same as for mid-mountain members of section Calyptrochilus such as *D. lawesii* and *D. subclausum.*

27. *Dendrobium habbemense* van Royen in Alpine Flora of New Guinea 2 : 424, Fig. 147 (1980).

Synonym *Dendrobium spathulatilabratum* van Royen op. cit. 427, Fig. 148.

This high altitude species occurs widely throughout the mountains of New Guinea between 2100 and 3500m (commonly 2600 – 3200m). It is a pretty species with bright orange, usually widely opened flowers often reddish towards the apex of the mentum. Flowers are mostly borne singly and the cup-like floral bracts on the stems are unusually persistent. Plants are pendulous to semi-erect and show a very distinctive feature in the fact that the apical end of the stem is usually 3 or 4 times thicker than the base of the stem. The stems are often branched and bear a few leaves near the apex. The ovary is without wings or distinct ribs. **Note:** The type specimens of both of van Royen's new taxa have been examined and the only difference between them is in the leaves. **Brass** 9022A *(D. habbemense)* has shorter, folded leaves which is a feature of plants growing in exposed positions. This is also indicated by the field note of L.J. Brass who collected this specimen near Lake Habbema (West New Guinea) in 1938.

Pseudobulbs: 10 – 100 x 0.2 – 0.7cm
Leaves: 2 – 10 x 0.2 – 0.8cm
Flowers: 2.2 – 4.0cm long
Cultivation: Although slow to establish this species grows well at Laiagam under 60% shade on slabs of tree-fern fibre.

ACKNOWLEDGEMENTS

The study of this group has been assisted by the kind help of many people who provided information or specimens from their institutions, as well as those in Papua New Guinea who provided plants. The authors wish to thank the Directors and staff of the institutes mentioned in the introduction and in particular the following: —

Mr M. Galore and Mr E.E. Henty (Lae); Mr J.S. Womersley (formerly of Lae); Prof. R.E. Holttum, Mr P. Taylor, Dr P.J. Cribb and Mr J.J. Wood (Kew); Dr H. Sleumer, Dr W. Vink, Dr E. de Vogel, Dr J.F. Veldkamp, Mr A.K. Groenewegen and Mr L. Vogelenzang (Leiden); Dr N. Hallé (Paris); Prof. C. Cook (Zurich); Dr A. Polatschek (Vienna); Mr E. Robbrecht (Brussels); Mr E.W. Groves (British Museum) and Dr D. Frodin (University of Papua New Guinea). We also acknowledge the help of the late Dr J. Raynal of Paris.

Dr P. van Royen provided an advance copy of his manuscript for which we are grateful, and we also thank our friends and colleagues at Edinburgh for their guidance and help, including the horticultural staff members Mr Bob Cranston and Mr Alistair Paxton. In addition we would like to thank the following growers and collectors: —

Rev. N.E.G. Cruttwell, Mr G.C. Elworthy, Mr M. Gunther, Mr N.H.S. Howcroft, Mrs A.N. Millar, Mr P. Sausman and Mr P. Spence. We thank Mr D.F. Blaxell of the Sydney Herbarium for reading the manuscript and providing constructive criticism, and Mrs B.J. Feist of Wabag, Papua New Guinea for typing the final draft.

Finally, the following local staff at the Highland Orchid Collection, Laiagam, are to be mentioned for their hard work in collecting and growing many of these orchids over the past five years: — Mr Kaul Dorum, Mr John Tari and Mr Malingi Ekape.

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APPENDIX

List of 96 Published Species Names in Section Oxyglossum with the Author and Year of Publication.

(NOTE: Tentative synonymy is indicated by the species number.)

D. adolphi Schltr. (1921)	– 15
D. albiviride van Royen (1980)	– 22
D. allioides J.J. Sm. (1935)	– 17
D. aurantivinosum van Royen (1980)	– 1
D. begoniicarpum J.J. Sm. (1912)	– 11
D. bilamellatum R.S. Rogers (1925)	– 22
D. brachyacron Schltr. (1919)	– 17
D. brachyphyta Schltr. (1923)	– 22
D. brevicaule Rolfe (1899)	– 1
D. caenosicallainum van Royen (1980)	– 22
D. caespitificum Ridl. (1916)	– 4
D. calcarium J.J. Sm. (1911)	– 1
D. cedricola van Royen (1980)	– 2
D. cellulosum J.J. Sm. (1929)	– 5
D. cerasinum Ridl. (1886)	– 15
D. chlorinum Ridl. (1916)	– 4
D. chrysornis Ridl. (1916)	– 2
D. coerulescens Schltr. (1912)	– 13
D. cyananthum L.O. Williams (1946)	– 18
D. cyanocentrum Schltr. (1905)	– 8
D. cyatheicola van Royen (1980)	– 1
D. cyperifolium Schltr. (1923)	– 19
D. dekockii J.J. Sm. (1911)	– 2
D. delicatulum Kraenzl. (1893)	– 14
D. discrepans J.J. Sm. (1913)	– 15
D. dryadum Schltr. (1912)	– 17
D. erythrocarpum J.J. Sm. (1929)	– 2
D. flavispiculum J.J. Sm. (1913)	– 8
D. frigidum Schltr. (1912)	– 4
D. gaudens van Royen (1980)	– 2
D. geluanum Schltr. (1921)	– 17
D. geminiflorum Schltr. (1919)	– 17
D. gemma Schltr. (1923)	– 4
D. habbemense van Royen (1980)	– 27
D. hellwigianum Kraenzl. (1893)	– 18
D. igneoviolaceum J.J. Sm. (1929)	– 19
D. junzaingense J.J. Sm. (1934)	– 11
D. kerewense van Royen (1980)	– 1
D. keysseri Schltr. (1919)	– 17
D. lancilabium J.J. Sm. (1934)	– 26
D. lapeyrouseoides Schltr. (1912)	– 9
D. lateriflorum Ridl. (1916)	– 15
D. maboroense Schltr. (1912)	– 24
D. masarangense Schltr. (1911)	– 3
D. microblepharum Schltr. (1923)	– 22
D. minutum Schltr. (1912)	– 14

(Note: Schlechter's type sheets sometimes have other manuscript names on them such as *D. altigenum* and *D. gemma.*)

D. monogrammoides J.J. Sm. (1929)	– 4
D. montigenum Ridl. (1916)	– 2
D. montistellare van Royen (1980)	– 1
D. murkelense J.J. Sm. (1928)	– 21
D. nanarauticola Fukuyama (1937)	– 14
D. nardoides Schltr. (1912)	– 6
D. nebularum Schltr. (1912)	– 21
D. oreocharis Schltr. (1912)	– 11
D. oligoblepharon Schltr. (1912)	– 15
D. palustre L.O. Williams (1946)	– 21
D. parvulum Rolfe (1899)	– 14
D. pentagonum Kraenzl. (1910)	– 1
D. pentapterum Schltr. (1905)	– 20
D. petiolatum Schltr. (1912)	– 23
D. pityphyllum Schltr. (1919)	– 17
D. prasinum Lindl. (1859)	– 25
D. pseudofrigidum J.J. Sm. (1929)	– 4
D. pumilio Schltr. (1912)	– 3
D. puniceum Ridl. (1886)	– 15
D. putnami Hawkes et Heller (1957)	– 13
D. quinquecostatum Schltr. (1912)	– 17
D. quinquecristatum van Royen (1980)	– 1
D. retroflexum J.J. Sm. (1911)	– 22
D. rhaphiotes Schltr. (1919)	– 18
D. rupestre J.J. Sm. (1911)	– 12
D. saruwagedicum Schltr. (1919)	– 1
D. scarlatinum Schltr. (1912)	– 15
D. scottiiferum J.J. Sm. (1934)	– 18
D. semeion van Royen (1980)	– 22
D. seranicum J.J. Sm. (1928)	– 16
D. spathulatilabratum van Royen (1980)	– 27
D. subacaule Reinw. ex Lindl. (1859)	– 11
D. subuliferum J.J. Sm. (1911)	– 7
D. sulphureum Schltr. (1912)	– 5
D. teligerum van Royen (1980)	– 1
D. tenens J.J. Sm. (1929)	– 22
D. tenuicalcar J.J. Sm. (1911)	– 17
D. theionanthum Schltr. (1912)	– 4
D. trialatum Schltr. (1912)	– 22
D. tricostatum Schltr. (1912)	– 11
D. trifolium J.J. Sm. (1917)	– 22
D. tumidulum Schltr. (1923)	– 21
D. uncinatum Schltr. (1912)	– 22
D. undatialatum Schltr. (1912)	– 24
D. unifoliatum Schltr. (1921)	– 23
D. vexillarius J.J. Sm. (1910)	– 22
D. violaceo-miniatum Schltr. (1921)	– 10
D. violaceum Kraenzl. (1910)	– 17
D. xiphiphorum van Royen (1980)	– 22
D. zaranense van Royen (1980)	– 1

T.M. REEVE
Dept. of Primary Industry
Laiagam, Enga Province
Papua New Guinea

P.J.B. WOODS
Royal Botanic Gardens
Edinburgh
Scotland

28 May, 1980

Dendrobium johannis and *Dendrobium semifuscum* in North Queensland

by P.S. Lavarack*
and P.J. Cribb**

Summary:
Dendrobium johannis var. *semifuscum* Rchb.f. is raised to specific status as *D. semifuscum* (Rchb.f.) Lavarack & Cribb and the differences between this species and *D. johannis* Rchb. f. are discussed.

In 1865 Reichenbach described *Dendrobium johannis* from a plant collected in "north Australia" by John G. Veitch in 1863. This species was subsequently figured in 1865 in *Curtis's Botanical Magazine* (t. 5540) and in 1885 in John Day's Scrapbook, volume 45, no. 77 (unpublished). Reichenbach states that "this . . . will be featured in the forthcoming number of the Botanical Magazine" so it may be assumed that the plant illustrated there is either the type or a specimen collected at the same time as the type. Both illustrations show a species with very dark petals and sepals and a lip which has a bright yellow mid-lobe. Other aspects which are apparent from these illustrations include the shape of the lip in which the lateral lobes, when flattened, are larger and broader than the mid-lobe; and the attitude of the mentum which lies parallel to the column.

The taxon which, in Australia, is usually referred to as *"D. johannis"* does not possess any of these characteristics. A good illustration may be seen on page 473 of *Australian Indigenous Orchids* (Dockrill, 1969).

In this case the mid-lobe is at least as broad as the lateral lobes and the mentum is held at almost a right angle to the column. The flowers are typically yellow-brown. This taxon was described by Reichenbach in 1883 from plants cultivated by Mr W. Bull as *D. johannis* var. *semifuscum.* Reichenbach apparently based this variety solely on the difference in colour. This variety was illustrated in the same year in John Day's Scrapbook vol. 32, no. 57 (unpublished) along with the following notes: —

"Another of Mr Wm. Bull's new species from Queensland which he very kindly sent to my rooms for me to draw today. It is a very curious species, the petals and sepals so twisted in the way of *D. undulatum.* The bulbs are rather like those of *D. fimbriatum*, fusiform, 18 inches to 2 ft long, sulcate in age, clothed with brownish scales when young. There are very few leaves remaining on the plant and those confined to the apex of the bulbs. The largest is 3½ inches by ¾ but no doubt towards the middle of the bulb they would be larger. They are stiff and smooth, pale yellowish green but they would no doubt be of a rich dark green when fresh. The scapes are 12 inches long, erect or suberect, bearing from 6 to 12 flowers. Mr Bull imported only 2 plants of it, one of which he sold to Mr John Bowring." It would appear almost certain from this that the illustration by Day is of the type specimen.

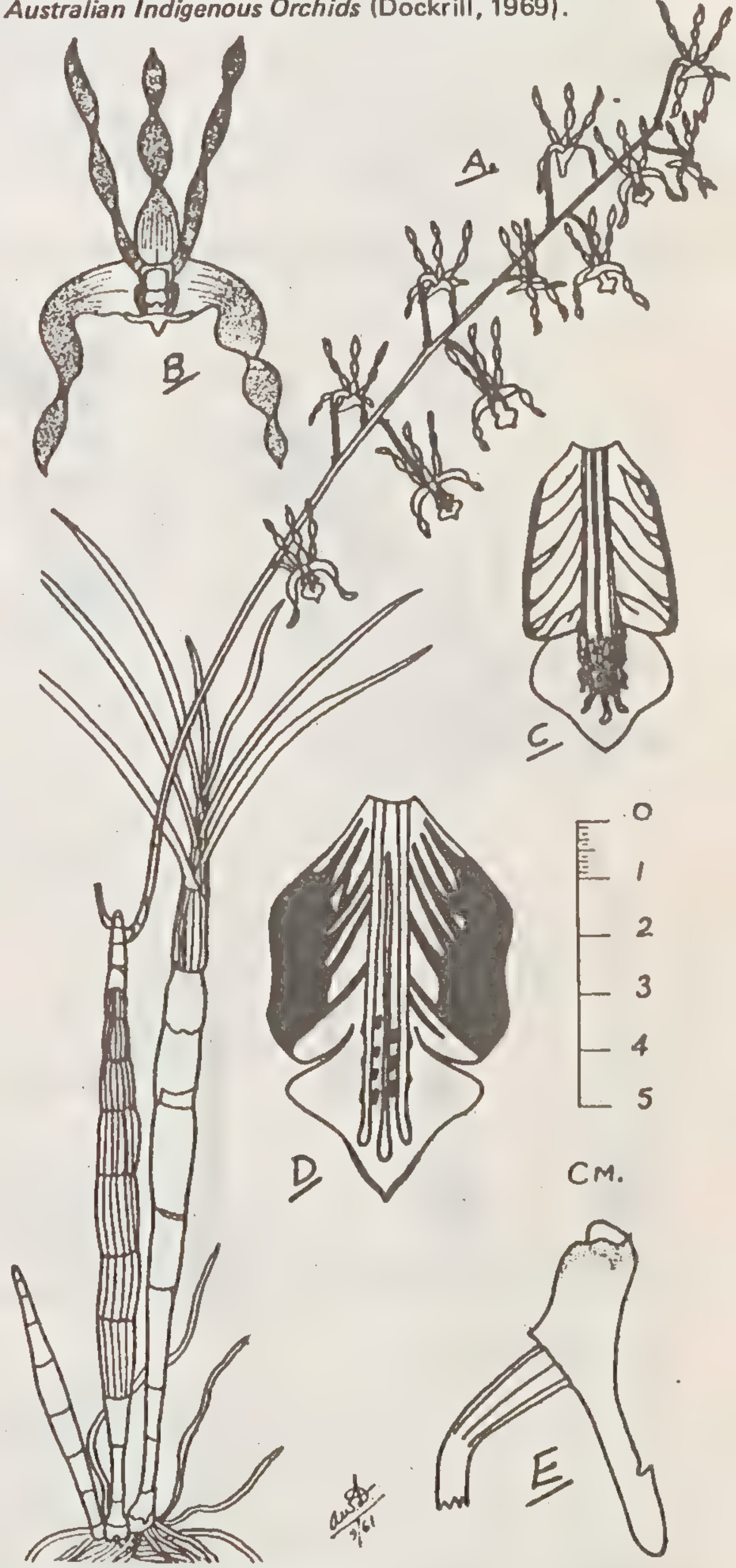
It became apparent to the authors separately, that two quite distinct species were being identified as *D. johannis.* Extensive field experience by one author (P.S.L.) indicated that one species has predominantly dark brown to purple petals and sepals with a yellow lip and flowers in Autumn (March to June) whilst the second species has yellowish petals and sepals and flowers in Spring (August to October).

The former of these (*D. johannis* of Reichenbach) is often cultivated under the name *"D. johannis* var. *nigrescens"* while the latter (*D. johannis* var. *semifuscum* of Reichenbach) is universally known as *"D. johannis".*

A careful study of plants in the field and in the herbarium has led the authors to the conclusion that these taxa differ sufficiently to be considered separate species. Therefore, it is now proposed that *Dendrobium johannis* var. *semifuscum* be raised to specific rank as follows: —

Dendrobium semifuscum *(Rchb.f.) Lavarack et Cribb* **stat. nov.** Type: Queensland *W. Bull* (W, holo.!)
D. johannis Rchb. f. var. *semifuscum* Rchb.f. in Gard. Chron. 1883 : 368.

A table of the differences between these species is given on page 210: —



A Portion of plant . . . to ½ indicated scale
B Flower from front . . . to scale x 2
C Labellum flattened (Melville Is. specm.) to scale x 3
D Labellum flattened (Cooktown specm.) to scale x 5
E Column from side . . . to scale x 5

Dendrobium johannis Rchb.f.
from Dockrill (1969) p. 473 loc. cit.

Table: Comparison of D. johannis with D. semifuscum

D. semifuscum	*D. johannis*
Mid-lobe of lip equal to or broader than the lateral lobes.	Mid-lobe narrower than the lateral lobes.
Anther cap deeply cleft.	Anther cap with a small notch.
Mentum at almost a right angle to the column.	Mentum parallel to the column.
Petals and sepals yellow to yellow-brown.	Petals and sepals a chocolate brown to purple with yellow mid-lobe.
Spring-flowering.	Autumn-flowering.

* * * * *

The separation of these two species is also reflected in the habitat in which they grow. *D. semifuscum* occurs in paper-barked *Melaleuca* woodland. The habitat of this species is usually dry between May and December and very wet in the remaining months. It is a harsh habitat of high temperatures and strong light even in mid-winter.

D. johannis usually grows in moister areas such as near the margins of the eastern rainforests and near the east coast. These are regions of some winter rainfall, year-round humidity and some shade.

D. semifuscum occurs on Cape York Peninsula north from about Archer Point, in the Top End of the Northern Territory and in New Guinea. *D. johannis* occurs near the east coast of Cape York Peninsula north from the Stewart River and on some of the islands of Torres Strait.

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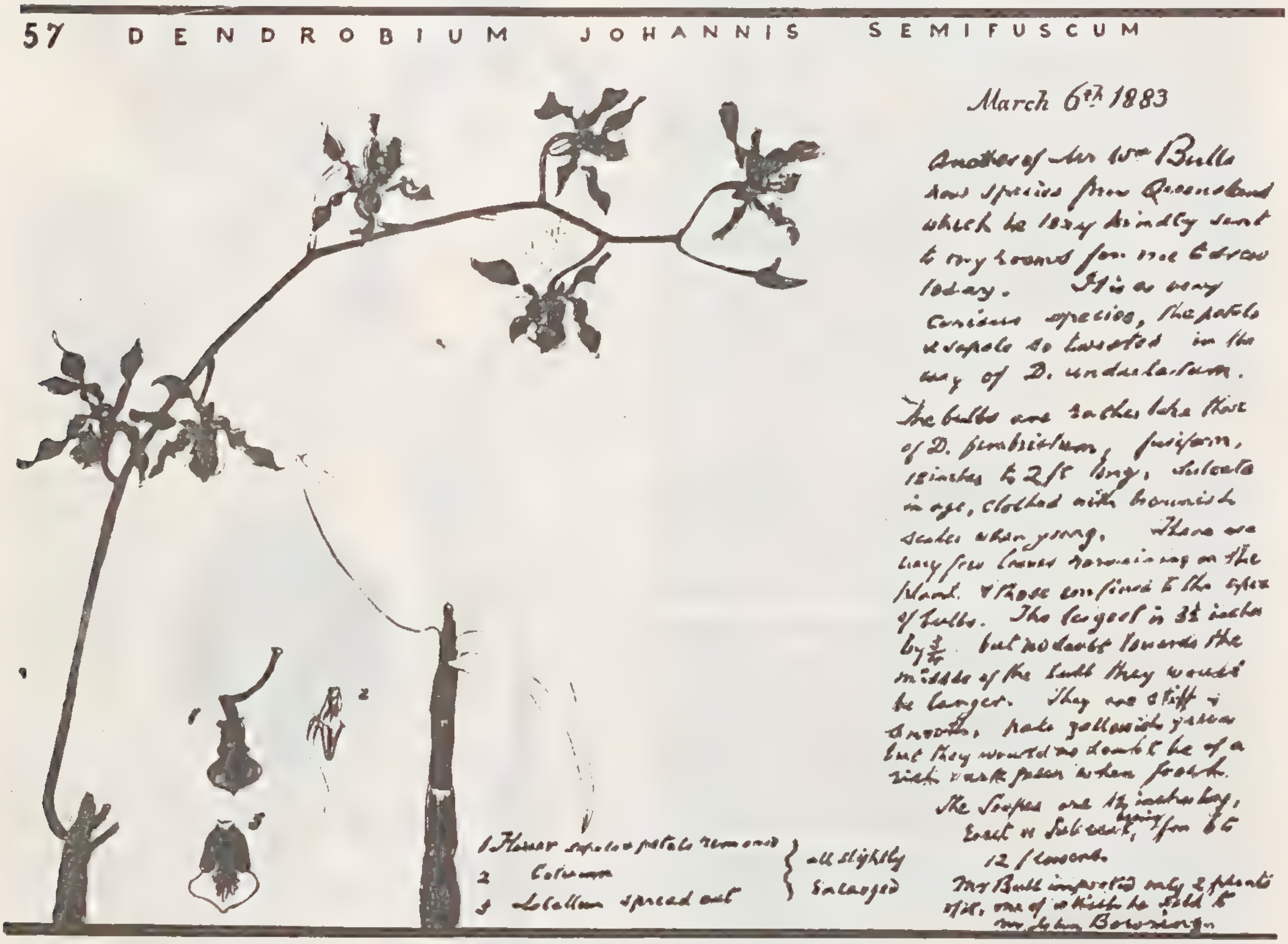
*National Parks and Wildlife Service
BRISBANE, QLD., AUSTRALIA
**Royal Botanic Gardens
KEW, ENGLAND

4 July, 1980


57 DENDROBIUM JOHANNIS SEMIFUSCUM
1
2
3
1 Flower sepals & petals removed
2 Column
3 Labellum spread out
all slightly enlarged

March 6th 1883

Another of Mr Wm Bulls new species from Queensland which he very kindly sent to my rooms for me to draw today. It is a very curious species, the petals & sepals so twisted in the way of D. undulatum.

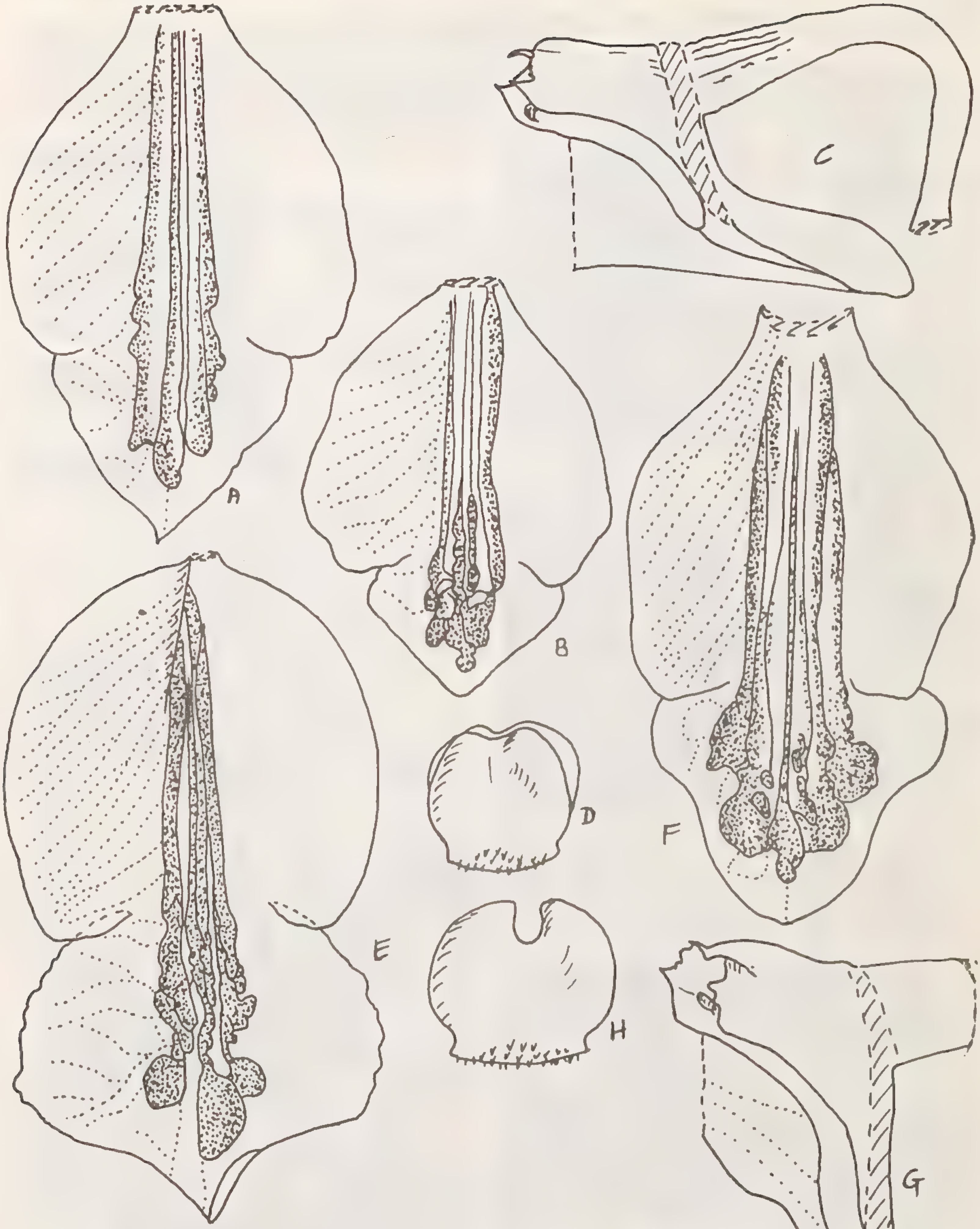
The bulbs are rather like those of D. fimbriatum, fusiform, 18 inches to 2 ft long, sulcate in age, clothed with brownish scales when young. There are very few leaves remaining on the plant, & those confined to the apex of bulbs. The largest is 3½ inches by ¾ but no doubt towards the middle of the bulb they would be larger. They are stiff & smooth, pale yellowish green but they would no doubt be of a rich dark green when fresh.

The scapes are 1½ inches long, erect or sub-erect, bearing from 6 to 12 flowers.

Mr Bull imported only 2 plants of it, one of which he sold to Mr John Bowring.

Dendrobium johannis semifuscum

Reproduced from a photocopy provided by Dr P.J. Cribb, this is our first use of an illustration from John Day's scrapbooks. Starting in January, 1863, and finishing in December, 1887, Day produced 53 "scrapbooks" to depict in monochrome and colour some 2,824 orchid species, subspecies and varieties. As yet unpublished, the Day Scrapbooks are among the invaluable assets of the Kew Herbarium. John Day's accurate drawing and painting, together with his careful, handwritten annotations make his work extremely valuable botanically as well as bearing witness to the ardent devotion of an amateur orchid collector. *The Orchid Review* of September, 1972, pp. 170-176 carried a paper entitled "Day's Monograph on Orchids" by David F. Sander, with some beautiful colour pictures from the Scrapbooks.



D. johannis Rchb.f.

A lip x 6
B lip x 6
C column, mentum & ovary x 6
D anther cap x 12

D. semifuscum (Rchb.f.) Lavarack & Cribb

E lip x 6
F lip x 6
G column, mentum & ovary x 6
H anther cap x 12

A, C, D *Lavarack,* Mossy Creek, Qld.; B Bot. Mag. t. 5540; E Lidderdale; F-H Lavarack, Olive R. Qld.

The True Identity of *Dendrobium ophioglossum* Rchb.f.

by P.S. Lavarack

Some recent doubts have been expressed (Dodd 1977, Clemesha 1978) concerning the correct name for the familiar New Guinea species (also doubtfully occurring in Australia) generally cultivated under the name of *"D. ophioglossum"* and illustrated as such by Dockrill (1969). This species is now usually considered to be *D. purpureum* Roxb. (syn.: *D. capituliflorum* Rolfe). This has solved one problem, but has created another. What is *D. ophioglossum* Rchb.f. ?

Recently while at Kew I took the opportunity to examine the type specimen of *D. ophioglossum*. This specimen was collected by H.N. Moseley of the "Challenger" Expedition at Cape York in September, 1874. It was described by H.G. Reichenbach in 1877. The description consists of a bare Latin text including no measurements and with no additional note. The flowers which are in a packet attached to the sheet are virtually unusable, however, one flower is in a less decomposed condition than the others and although no details can be discerned, the general shape remains. Rolfe in a note on the sheet asked "is this distinct from *D. smillieae* ?" Kraenzlin (1910) examined the specimen and came to the conclusion that the spur differed from that of *D. smillieae* in that it is fusiform. The present author on examining this flower could see no reason to doubt that it was typical *D. smillieae*. This diagnosis was confirmed by the habit of the plant and by the length and position of the inflorescences which are typical of that species.

It is interesting that even Reichenbach (1879) had doubts about the identity of his *D. ophioglossum*. In an article concerned with *D. smillieae* he wrote: "There is a critical species, named by me *Dendrobium ophioglossum*, that was collected near Cape York by Mr Moseley, the naturalist of the *Challenger* expedition. The specimen is a very bad one. It has a more slender stem, narrower longer leaves, and a very acute, not retuse chin. The transverse keel runs over the lip. It should be well compared with other species when better materials are available. I regard it as a not fully legitimised species".

Clemesha (loc. cit.) suggested that the type specimen may be "a small specimen of *D. smillieae* or that it was not from Australia". The present author is satisfied that the type represents an average example of the admittedly variable *D. smillieae* as it occurs on Cape York Peninsula and therefore it is proposed that *D. ophioglossum* Rchb.f. should be regarded as a synonym of *D. smillieae* F. Muell.

Dendrobium smillieae *F. Muell.*, Fragm. Phyt. Aust. (1867) *6* : 94.
Type: Rockingham Bay, *J. Dallachy* (MEL, holo.)
D. ophioglossum Rchb. f. in J. Linn. Soc. Bot. (1876) *15* : 113 **syn. nov.**
Type: Cape York, *Moseley* (K, holo.!)

The confusion between *D. ophioglossum* Rchb.f. and *D. purpureum* Roxb. apparently dates back to an article in the *Australian Orchid Review* by C.T. White (1943). Here White identified a plant from the Solomon Islands as *D. ophioglossum*. The photograph appears to be of a typical *D. purpureum* as it is presently understood.

D. smillieae is a well known species from northern Queensland (and New Guinea) but what of *D. purpureum* ? Does it occur in Australia ? The present author has been able to locate no specimens in herbaria of *D. purpureum* (or *D. capituliflorum*) from Australia. Indeed the only specimen labelled *"D. ophioglossum"* from Australia is the Moseley Type. Furthermore several detailed searches by the present author and by others have failed to locate any plants on Cape York.

As no Australian specimens of *D. purpureum* exist this species should not be regarded as occurring in Australia.

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Reichenbach, H.G. (1879)	In Gardener's Chronicle *XI* (265) : 106.
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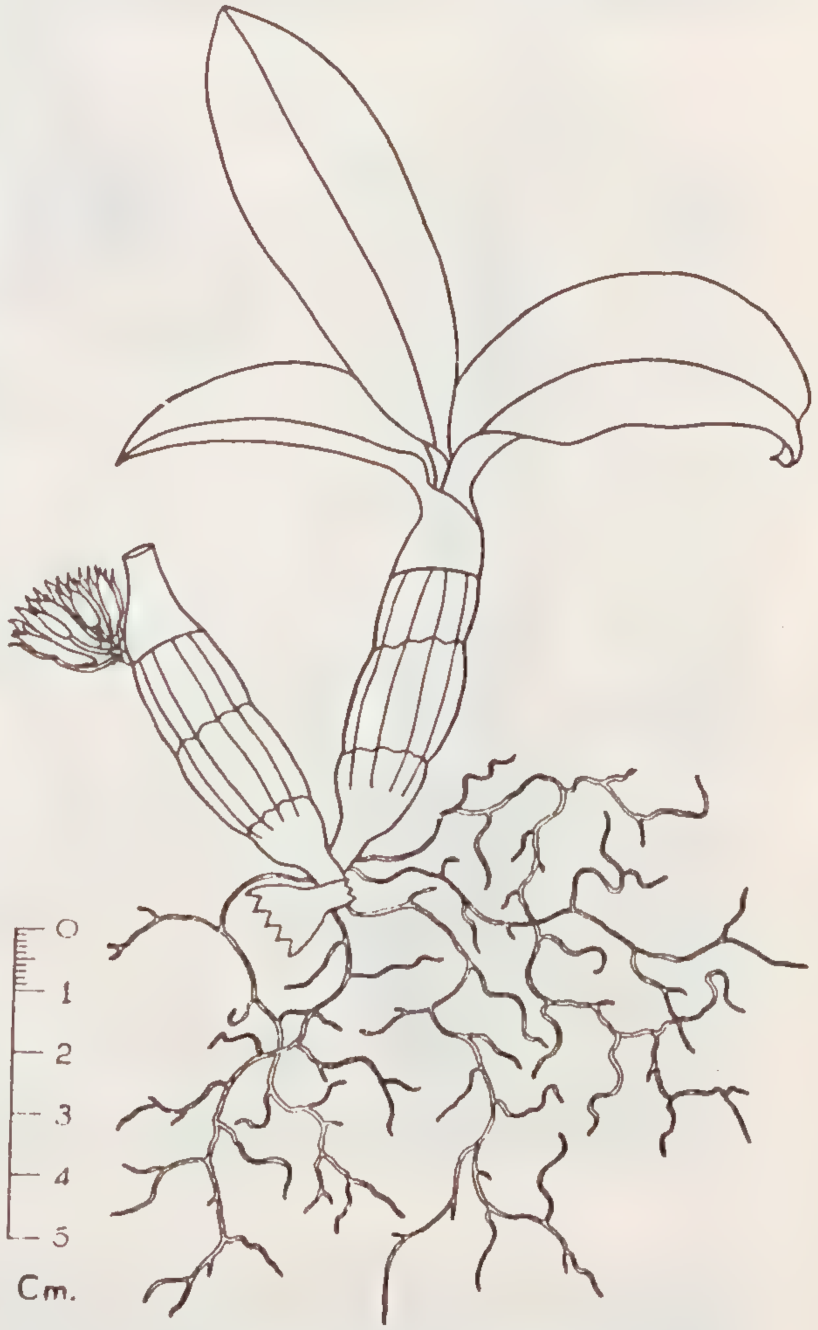
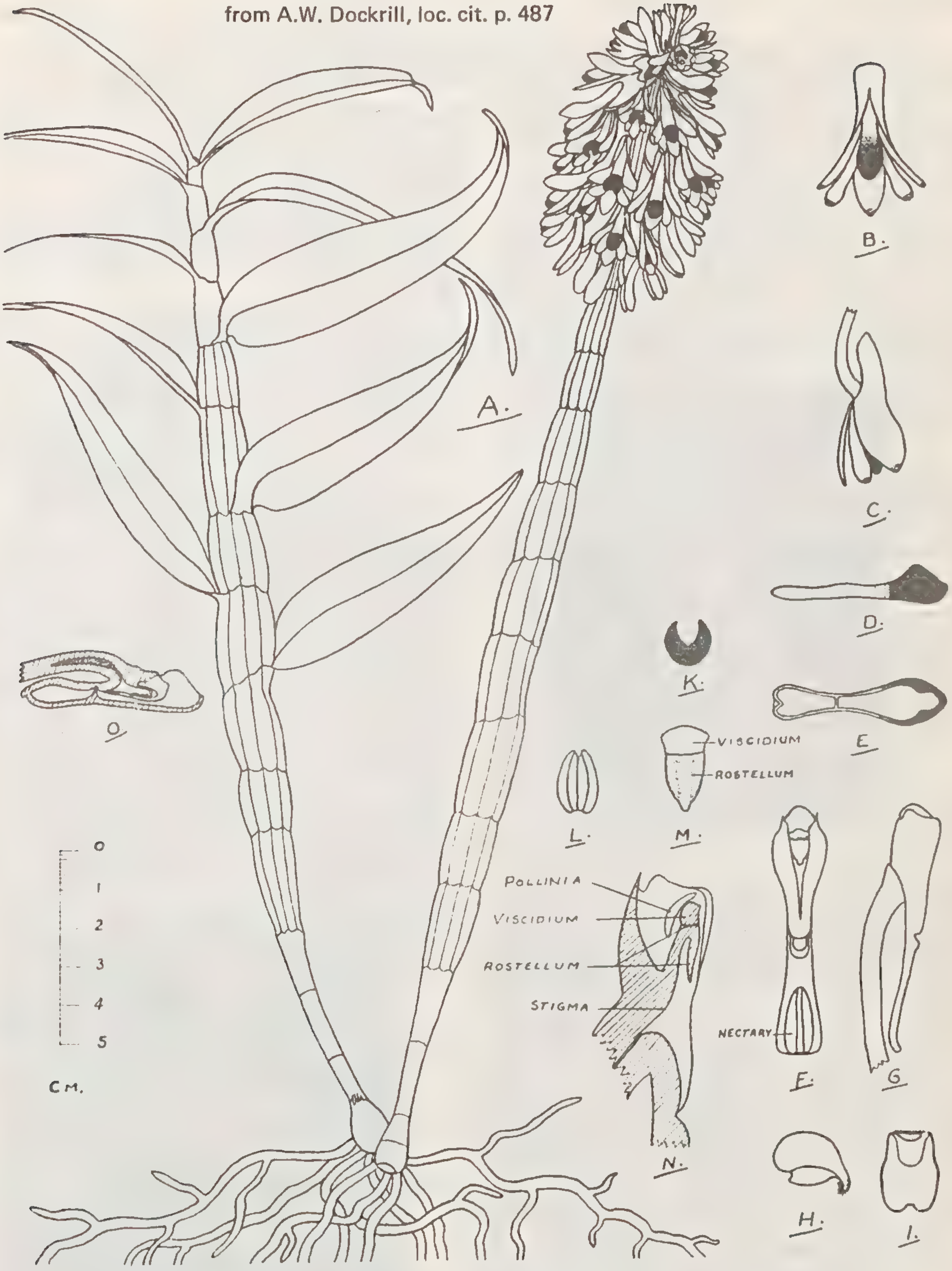
National Parks and Wildlife Service
BRISBANE, QLD.

4 July, 1980



Drawing of *Dendrobium ophioglossum* Rchb.f. by A.W. Dockrill (loc. cit. p. 489) "Taken from New Guinea material (very small plant)" — to indicated scale. J. Dodd's article in *Orchadian* 5 (8) : 112-113 includes a similar drawing of *"D. purpureum* Roxb. (syn. *D. capituliflorum* Rolfe; *D. ophioglossum* Rchb.f.)".

DENDROBIUM SMILLIEAE F. MUELL.
from A.W. Dockrill, loc. cit. p. 487



A. Portion of small plant . . to scale
B. Flower from the front . . to scale x 2.
C. Flower from the side . . to scale x 2.
D. Labellum from the side . to scale x 3.
E. Labellum from above (below) to scale x 3.
F. Column from the front . to scale x 5.
G. Column from the side . . to scale x 5.
H. Anther from the side . . to scale x 10.
I. Anther from above . . . to scale x 10.
K. Labellum from the front . to scale x 3.
L. Pollinia from behind . . to scale x 10.
M. Rostellum from the front . to scale x 10.
N. Longitudinal section of top of column (anther removed) . . . to scale x 10.
O. Median longitudinal section of column and labellum . . . . . . to scale x 3.

Cantharophily and the Pollination of *Peristeranthus hillii*

by B.J. Wallace

The field observations in the following article were made by Peter Vaughan in early November, 1976 at Berkeley Vale on the Central Coast of N.S.W. and passed on by him to me to report. The plants were growing in cultivation under bush-house conditions; the location is about 150 km south of the southern limit of the known range of the species.

One lycid and two elaterid beetles were seen attending the inflorescences under observation. They were later identified by Dr J. Lawrence (Curator of Coleoptera at the Australian National Insect Collection, C.S.I.R.O., Canberra) as *Agonischius australis* male and female and *Metriorrhynchus* sp. (specimens lodged with A.N.I.C.).

On a fine, warm November morning, the female *Agonischius* and the *Metriorrhynchus* were first seen resting on the *Peristeranthus* flowers. At this time it was noticed that 75% of them had their pollinaria removed, whereas the previous day they were all intact. Neither beetle had pollinia attached to it at this stage. The *Metriorrhynchus* was the first to become active and probed into a flower, apparently taking up nectar, for about 4 minutes. As it withdrew, the base of the left antenna contacted the retinaculum of the pollinarium which stuck, pulling the pollinia and anther cap away all in one unit. The beetle was then captured and after about 10 minutes the anther cap fell off, leaving the pollinarium attached to the antenna.

A short time later the male *Agonischius* was seen flying in a broad zig-zag path towards the plant, giving the impression that it was following a scent gradient, apparently homing on a pheromone being released by the female. After a couple of minutes of this flight pattern it landed about 4cm from the female *Agonischius,* moved directly to it and commenced copulation. After 10 minutes the male moved away and began feeding from the flowers' nectar, probing several flowers, remaining at each for about 30 seconds to two minutes. It changed from one inflorescence to another several times and its pattern of movement did not seem systematic except in that almost all of the flowers it did probe were those with pollinaria intact. About 15 minutes after the male began feeding the female flew off and was captured and the male also shortly afterwards. Neither had apparently removed any pollinia.

Later observations revealed that three fruits were set from a total of 47 flowers on two inflorescences – about a 6% pollination success. This is in accord with other observations from Port Macquarie, New South Wales, by the writer, where success of the same approximate order has been noted.

The above observations of the *Metriorrhynchus* behaviour, as well as that on its morphology, the position of the pollinia attachment on it, pollinarium behaviour and the morphology and arrangements of the flower parts, especially the column, stigma and labellum, are regarded as sufficient evidence to assume that this beetle effectively collects, transfers *and* deposits the pollinia of *Peristeranthus.*

Similar observations of small, narrow beetles visiting flowers of *Peristeranthus* have been made in north Queensland (B. Gray pers. comm.) but positive identification of the insects involved there was not made. Thus there is clear evidence that this orchid is typically attractive to and visited by, and in some cases pollinated by small, nectar-feeding beetles of this general type. Small, unidentified (possibly family Amatidae), day-flying, black, orange-spotted moths have also been seen feeding on the nectar of *Peristeranthus* flowers by the writer at Port Macquarie. Similar moths have been reported carrying orchid pollinia in Nigeria (Johansson, 1974) but in the Port Macquarie case, neither pollination nor pollinia removal was effected.

Looking closer at the disposition of the inflorescence, flowers and flower parts and their morphology, as well as that of the pollinating beetle (See Fig. 1), the extent of "fit" of insect in flower suggests some degree of adaptation of shape has occurred, probably on the part of the flower and is possibly a "pre-adaptation" (see later discussion).

The features of the *Peristeranthus* flower and inflorescence which relate positively to its pollination ecology (except those common to orchids in general) include:

a) the strong fruity/spicy/honey-like perfume given off by the flowers; this is probably the long-distance signal to searching insects. It is perceptible to humans from a distance of at least two metres and thus from considerably further by insects specialised in nectar-seeking.

b) the relatively long, pendulous, many-flowered inflorescence is probably a medium range signal to an insect homing in on the perfume. Experimental work by various people (e.g. Manning, 1956; Kügler, in Percival, 1965) indicates that some insects are capable of learning and recognising specific shapes.

c) free nectar secreted in the cupped labellum provides a reward well worth an insect's seeking out.

d) the close spacing of the flowers facilitates pollinator movement from one to the next by crawling — not unimportant for less nimble fliers such as beetles.

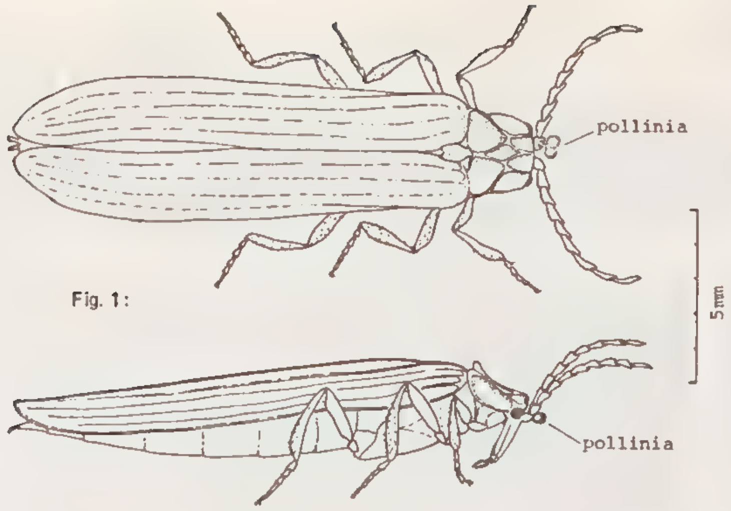
e) the function of the pollinarium brings about a delay of several minutes between the time of collection and deposition, thus helping to ensure cross-pollination. When the pollinia are removed the anther cap remains on top of them for a time before it falls, is bumped off or is deposited on another flower's stigma in place of the pollinia; the cap removal allows more rapid evaporation from the stipe which causes it to bend, bringing the pollinia forward into a position more favourable for deposition on the stigma. Drying of the retinacular adhesive decreases its grip on the pollinator and the pollinia are thus more easily retained by the stigma after some minutes. (See Fig. 2b) These delay mechanisms are common to many species of this subtribe.

The pollination by small beetles of orchids with long inflorescences of many small, closely spaced, fragrant, nectar-bearing, dull-coloured flowers has been noted in at least four other cases. R.S. Rogers (1913) describes the pollination of *Prasophyllum gracile* by a small beetle, *Trogoderma adelaidae* (family Chrysomelidae) and Edith Coleman (1933) reports on *Prasophyllum muelleri* pollination, again by a chrysomelid, *Amatella spinolae.* She also mentions three other, unspecified beetle/*Prasophyllum* associations. Two other, European cases involve the Common Twayblade, *Listera ovata* and the click-beetle *Athous haemorroidalis,* and the Frog Orchid *Coeloglossum viride* and a sp. of *Cantharis* (family Cantharidae) (Proctor and Yeo, 1973). These all differ from the case of *Peristeranthus* in three important ways — they are terrestrial plants of open communities with erect inflorescences, whereas the latter is a rainforest epiphyte with a pendulous inflorescence. They also belong to four different tribes — Diurideae, Neottieae, Orchideae and Vandeae.

Faegri and van der Pijl (1966) proposed the pollination syndrome of cantharophily (literally : beetle-loving) as including the following features: --

a) pollination units (flowers or inflorescences) offering few visual cues, are generally flat, cylindric, or bowl-shaped and easily accessible,
b) colours dull, frequently greenish or off-white,
c) rewards easily accessible, usually pollen, nectar or food-bodies,
d) odour strong and fruity or proteinoid,
e) anthers and stigmas exposed — pollination by "messing about",
f) ovary epigynous (flower parts attached to the top of the ovary for protection of the ovary and ovules).

Thus, while all the above cases display some characters of this syndrome, notably flower colour, odour, and type of reward, they differ from it in other important respects, viz. shape of the pollination unit (flower in this case), reward accessibility and position of the anthers and stigmas and pollination process — here comparatively precise and exacting. For these reasons, an addition to the system of Faegri and van der Pijl can be suggested — a sub-syndrome of small beetle, orchid pollination.



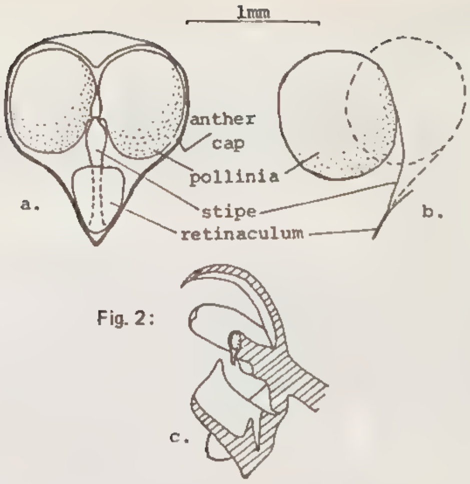


Fig. 1: *Metriorrhynchus* sp.
Fig. 2: *Peristeranthus hillii* a) underside of intact anther; b) side view of pollinarium — solid outline shows shape when freshly removed, broken line after 4 mins.; c) longit. sect. flower, to same scale as beetle.

Its features would include: —

a) inflorescence relatively long and narrow, many-flowered,
b) flowers small and closely spaced,
c) flowers not brightly coloured, mostly greenish,
d) odour sweet or spicy,
e) nectar reward; so placed as to ± precisely position the pollinator for pollinia collection and deposition.

Beetles are thought to have been the pollinators of the very earliest vector pollinated plants and of the earliest flowering plants (angiosperms) (Leppik, 1963); indeed, they are today the agents for some extant primitive angiosperms, e.g. *Eupomatia* and some *Magnolia* spp. It is therefore a little surprising to find a number of them regularly pollinating such highly specialised flowers as the orchids.

There is evidence, however, to suggest that beetle/orchid pollination is of a secondary and chance, as well as multiple origin. Such evidence includes the fact of promiscuity of pollinators in e.g. the *Listera* and *Coeloglossum* cases and the variety of visitors in these and *Peristeranthus* (and inferred by Rogers for *Prasophyllum*). Also beetles are relatively unspecialised in their morphology and behaviour when compared with the more usual orchid pollinating insects such as bees, flies and wasps; the flowers are usually closely adapted to these and mostly not promiscuous. There is then, the distinct possibility that these flowers originally evolved with and adapted to a specific pollinator which later became extinct, or were not to be found in new areas dispersed to and colonised by the orchids. But, having sufficient generalised attractive features such as sweet scent and ample free nectar, were able to lure various visitors, one or a couple of which were of appropriate size, morphology and behaviour to effectively and consistently pollinate the flowers.

Fig. 3: *Peristeranthus hillii* — Part of pendulous raceme—much enlarged close-up. Flowers are 4.5–7.0mm in diameter.

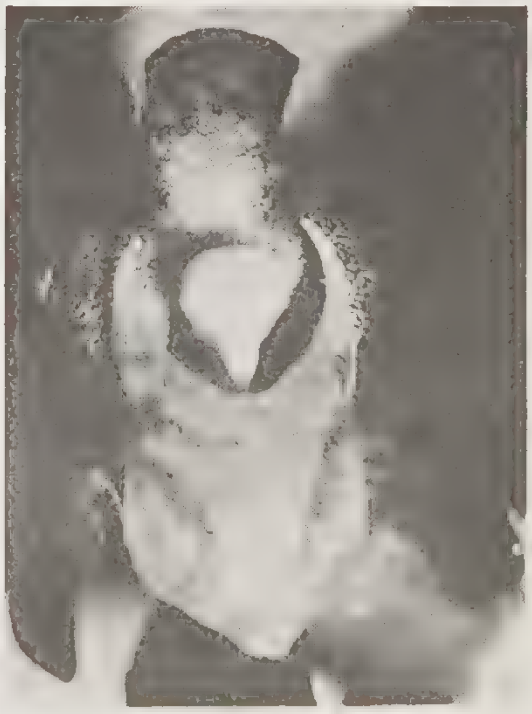


Fig. 4: *Peristeranthus hillii* — Close-up photograph of single flower.

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Botany Department
University of New England
Armidale, N.S.W. 2351

18 April, 1980

Native Orchids of New Zealand — Epiphytes

9 — *Bulbophyllum* Thouars

by Dorothy Cooper

This is a large and diverse genus of orchids but New Zealand has only two representatives — *B. pygmaeum* (Smith) Lindl. and *B. tuberculatum* Col. *B. tuberculatum* is apparently much rarer than *B. pygmaeum* but these orchids are small and inconspicuous and as has been shown by the recent discovery of *B. tuberculatum* on the Australian mainland (see *The Orchadian* Vol. 6, Dec. 1979) it may only be because of this and their inaccessibility that they have not been found more frequently.

B. pygmaeum is more common although still fairly rare and has even been reported growing on rocks near the coast. Both species usually grow high on tree trunks and are consequently only found when trees or branches fall to the ground. *B. pygmaeum* is New Zealand's smallest epiphytic orchid and while it does form dense mats over quite large areas of tree trunks or rocks, each individual rhizome has pseudobulbs that are only 3 — 5mm in diameter, each with a single leaf 4 — 10mm long by 2 — 4mm broad. The minute flower may be found from November to March, but a magnifying glass is needed to see any details, the flower itself being little more than a white spot to the naked eye.

I have not yet found *B. tuberculatum* which flowers during April and May, so descriptions used in this article are based on dried material from Kaitaia, in the herbarium of the British Museum (Natural History) London, and on other published reports, notably T.C. Moss 1968. Bull. Wellington Botanical Society, no. 35, and Moore and Edgar, 'Flora of New Zealand'.

Both species have membranous flowers which develop on a stalk from the base of the pseudobulb. Material at the British Museum shows that several flowering stalks may develop from the base of the same pseudobulb in *B. tuberculatum*, each with several alternate flowers, usually 3 or 4. The flowers are white, with a red labellum fading to yellow in the centre, with 2 raised longitudinal ridges at the base. Colenso reports tips of sepals with a violet tinge, and Moss reports purple pigment in various parts of the plant when growing in strong light. Old flower stalks persist on the plants.

In *B. pygmaeum* the flower is solitary, creamy white and very limp and membranous. There is a central orange stripe on the labellum in mature flowers.

Both species seem to grow in association with an odd-looking fern — *Pyrrosia serpens*, which does not look like a fern at all but is recognised as such by the numerous sori on the back of the thick leaves. This forms a mat of fine decomposed black material for nutriment which, if too thick, would be unsuitable for these Bulbophyllums to grow in and yet if too thin would allow greater drying and desiccation. Crustose lichens also grow in the same situations often overwhelming the orchids.

Closely packed pseudobulbs, especially in *B. tuberculatum* where the internodes between pseudobulbs are usually shorter than the diameter of the pseudobulbs, seems to cause dead areas in the 'mats'. As old bulbs die any young new growth is forced up into the air where there is no organic matter to support it.

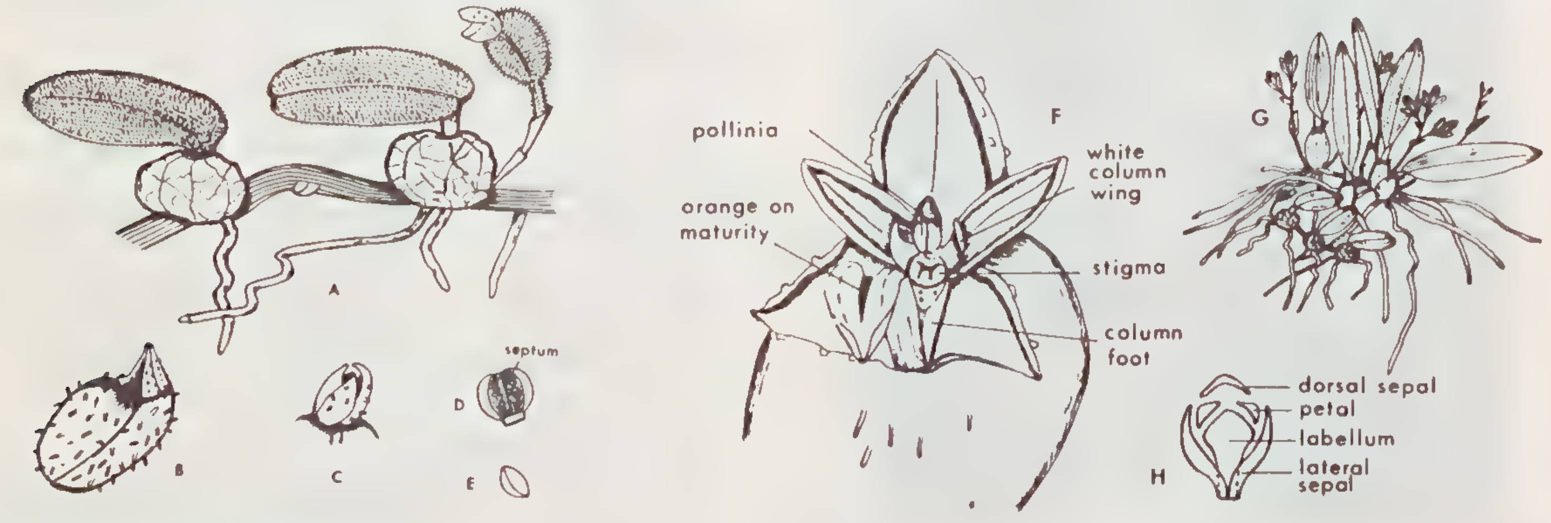
Compared with those of *B. tuberculatum*, the pseudobulbs of *B. pygmaeum* are short and broad. They are also more wrinkled, while the flower is only 1.5mm in diameter, and sits on the top of the developing capsule which is on a 2 — 4mm stalk that elongates as it matures. In *B. tuberculatum* the large ovoid pseudobulbs are 6 —10mm by 3 – 6mm and seem to be somewhat smoother. The 3 — 5mm flowers are on a 1 — 2cm stalk, each flower with a bract at its base. The leaf is much larger in this species, up to 50mm by 5mm, although usually smaller and the ovary and peduncle have minute blunt tubercles. In *B. pygmaeum* the leaf, ovary and peduncle are covered in minute bristles.

The flower of *B. pygmaeum* does not seem to open fully. The accompanying illustrations are of a partly open flower which I prised open to study the internal structure. After studying the flowers closely for several weeks only a few were observed to have 'loosened' at the tips — as if they had opened and closed again, most showed no signs of opening. The withered flower stays on the hairy 3mm long capsule even when fully mature, and as the capsule splits into two different portions, the perianth remains attached to the dorsal part. There are two loose papery bracts at the base of the ovary stalk.

The four pollinia of *B. pygmaeum* are waxy and very hard — almost stone-like — and lie beneath a yellow anther cap. They seem to be very stiff to remove and have no caudicles. There is a long column foot and the labellum is hinged to the base of it. Lateral white column wings are present. The petals are narrower than the dorsal sepal which is smaller than the large triangular shaped lateral sepals. The sepals have peculiar hairy growths on their outer surface which do not seem to be present in *B. tuberculatum*. The pollinia in *B. tuberculatum* are also free, lateral column wings are present, and remains of a membranous scale leaf can be seen at the base of each leaf.

B. tuberculatum is most common in the North Island and is also reported from Collingwood in the north of the South Island, while *B. pygmaeum* occurs throughout New Zealand but is probably more abundant in the north.

14 Avalon Crescent
10 April, 1980 **LOWER HUTT, New Zealand**



Bulbophyllum pygmaeum
- A section of rhizome, enlarged
- B capsule and flower
- C 'open' flower
- D anther cap, pollinia removed
- E pollinium
- F flower prised open to show internal structure
- G showing relative size of *B. pygmaeum* and *B. tuberculatum*
- H diagram of floral structure

Drawing: Dorothy Cooper

CULTIVATION OF CALADENIA

by R. Bates

The terrestrial orchid genus Caladenia contains over seventy species, mainly from the temperate regions of Australia and includes some delightful forms, many ideal for pot culture.

The colour range includes pure white *(C. catentata)*, red and pink *(C. catenata)*, blue *(C. deformis)*, yellow *(C. flava)* and many vari-coloured species like the 'spider' orchids, with long filamentous sepals *(C. patersonii* and *C. filamentosa)*.

There are gently fragrant species like *C. angustata* and others like *C. gladiolata* with powerful spicy perfumes, but all have the reputation of being difficult to grow.

It appears that most Caladenia require the presence of a specific soil fungus throughout their life (not just for germination). The deciduous Caladenia each year produce a single small leaf at ground level, yet flowers form on most mature plants and may be quite large (up to 10cm) — a pattern consistent with semisaprophytic orchids. Obviously then the orchid can survive in cultivation for only as long as the grower is able to keep the fungus healthy. When the benign fungus dies it is often replaced by pathogenic fungi which rapidly kill the orchids.

Cultivation of Caladenia actually involves far less work than caring for more commonly grown Dendrobium or Pterostylis because Caladenia are fairly disease-resistant; complete their life cycle in the cooler months when insect pests are dormant; do not require fertilizing or watering and because of the short growing season the grower can forget about them for 4 — 5 months of the year except for repotting.

Methods:

Cultivation of Caladenia involves three important annual activities —

1. **Each Summer** repotting into fresh soil is essential for several reasons —

a) it allows for even distribution of plants in the pot,
b) throwing out the old soil removes pathogens which build up each year,
c) seedlings can be removed to separate pots.

The best soil is gravelly loam straight from the bush, preferably from an area where Caladenia thrive naturally. This soil can be conditioned by adding peatmoss.

Squat clay pots are ideal, as good drainage is essential. Crocking is not necessary and will only provide homes for slugs and other pests.

If you already have a pot of Caladenia with seedlings it is best, at repotting time, to remove the top 2 — 3cm of soil containing seedling tubers to separate pots and then tip the remaining soil and tubers into a sieve to sift out the deeply buried mature tubers. Trim off excess fibrous sheathing, leaving 1 — 2cm of "wick". Space tubers evenly in a clean pot, largest ones in the centre. This whole operation must be done with careful hygiene. Clean hands are essential. Cover tubers with 4 — 6cm of soil and top up pot with a thin layer of bush leaf litter. Water thoroughly under a slow sprinkler and forget about the pot until April.

2. **April-May** is seed sowing time. Spread seed evenly on the surface and cover with a thin layer of chopped pine needles or fine leaf litter from the bush. Seedlings appear in about 4 months.

3. **Springtime** — besides being the time to show off your Caladenia blooms — is the time to pollinate the flowers. Pollinate only 2 — 3 flowers per pot as plants bearing seeds are weakened and their tubers may desiccate over summer. The seed pods should be collected when they begin to turn brown, before they split, and stored in a sealed envelope. No special treatments such as freezing or drying are needed and one seed-pod of Caladenia produces fifty or so seedlings.

Important Hints:

Do not fertilize Caladenias until you are sure that the species will benefit. Even a weak dose of Nitrosol may destroy a whole crop of seedlings. Do not contaminate the soil by touching with dirty hands. A good even light (about 50%) is best. Sow seed annually to cover the loss of mature tubers. Seedlings will flower in their third year and soon you should have enough to build up several specimen pots. Some Caladenias *(C. latifolia, C. menziesii)* also reproduce vegetatively.

A trick which can be used to produce exceptionally large flowers is to cut the buds off all plants in the pot on alternate years. A very large tuber will result as all food is channelled below ground. Of course it means a year without flowers, a luxury that can only be afforded if you have more than one pot of the species.

Caladenia will produce two tubers a year if you tip out the plants soon after flowering, remove the new tuber and then repot the plants. You then have twice as many tubers but only about 25% will flower. (Flowering rate for Caladenia is usually about 90%).

The future seems bright for the successful grower of **Caladenia.**

38 Portmarnock Street
February, 1980 **FAIRVIEW PARK, S.A. 5126**

NEW AUSTRALIAN NATIVE ORCHID HYBRIDS

The following R.H.S. list appeared in *The Orchid Review* for May/June, 1980 (February-March registrations): —

Dendrobium

Emma	Gillian Leaney x *tetragonum*	W.T. Upton
Golden Fleck	*fleckeri x gracilicaule*	D.M. Cannon (W. & J. Cannons)
Kit Murdoch	*kingianum* x Susan	D.M. Cannon
Michael Jupp	**beckleri x linguiforme*	V. & N. Jupp
Star Delight	Star of Gold x *ruppianum*	V. & N. Jupp
Star of Dawn	Star of Gold x *kingianum*	V. & N. Jupp
Sunglow	*speciosum x fleckeri*	D..M. Cannon (R. Bedford)

* This is the first occurence of *D. beckleri* as a parent in hybrid registration.

Noel Jupp reports interesting results in seedlings from more advanced crossings and that *D. tetragonum v. giganteum* and *D. fleckeri* seem to be the most important lines for breeding; but he points out that we may have to look at the label to know which of the new high quality flowers we are looking at. Do we want this? All big and beautiful and much the same — like production line commercial cymbidiums and cattleyas! Is it possible to reconcile our desire for individual works of nature with the desire for bigger and better? **D. Star of Dawn** is like an improved D. Ellen, 2½" across; sepals and petals yellow/mauve; labellum broad and reddish mauve. A very good grower **D. Star Delight** was slow to flower but "worth the wait", 2" across and 18 to the spray; tepals yellow fading to a lighter shade on maturing; labellum broad, pinkish mauve with deeper reining. **D. Michael Jupp** is a compact plant with compact inflorescences; flowers open wide and flat, about 1" across, near white shading to reddish purple at base; labellum mauve and white. Very highly scented.

David Cannon advises that comments on a number of his crosses will be ready for our next issue — with illustrations. Meanwhile, many readers will recognise that D. Kit Murdoch is named for the late wife of the foundation president of A.N.O.S., Bill Murdoch.

— EDITOR

AUSTRALASIAN NATIVE ORCHID SOCIETY

Annual General Meeting — 9 August, 1980

PRESIDENT'S REPORT

Ladies and Gentlemen,

Welcome to the 1980 Annual General Meeting. I think that the second most significant event in the life of a Society, after its creation, is when it has grown to the point whereby amateur help is no longer sufficient and the professional is required — about equivalent to becoming a teenager! So it is with A.N.O.S. This year saw the membership records handed over to the custody of B. & C. Mailing Service Pty. Ltd. Initially this is placing a strain on the Society's cash resources, however, it is the belief of this Council that this effect will be short term and that we must look ahead several years to when the Society will be much larger.

You have all seen the pamphlet which was prepared for prospective members. It is gratifying to see the interest this has created and the number of new members joining.

Mention was made by me last year of the Index for *The Orchadian.* Unfortunately it is not yet completed. The member who is doing most of compiling of the Orchidaceae and Authors Section has been away for most of this year. I understand that he is half way through Volume 5, so the work is nearly completed.

Members have been notified regarding the reprinting of Volume 1. This is a facsimile edition and will be issued unbound in the quarto size to match Vols. 2 — 5. I urge members who want this volume and who have not ordered the reprint, to do so as soon as possible. Whilst on the subject of facsimiles, Council has done some hard thinking as to the future of the back issues of *The Orchadian.* It is readily recognised that the revenue generated from the sale of these is significant; however, so are the reprinting costs. After much investigation it has been decided to use high class dry paper photocopies to reproduce the appropriate issues of *The Orchadian.* The unit cost is no cheaper than printing, however, we will be able to photocopy the exact number required, and not have to accept 200 copies at a time. The photocopies will be double-sided and will be nearly indistinguishable from the originals — main difference is better paper! In the longer term it is Council's aim to restrict back issues to the most recent two volumes.

The National Award Scheme was launched on 1 March, 1980 and I trust that members and other Societies are keeping their eyes open for that extra special plant which merits an entry for the National Award.

The influence of A.N.O.S. continues to expand, as is evidenced by —

1. the number of Affiliated Societies,
2. the standard of articles appearing in *The Orchadian,*
3. the steady flow of new members.

During the year there were two resignations from Council, Mr R. Calkin as Treasurer and Mrs M. Shelley as Assistant Secretary. These positions were filled by Mr E. Husted and Mrs N. Martin respectively.

At this point I would like to say a special "thank you" to all those members, artists and professional botanists who have given so freely of their time and knowledge in the writing of articles for *The Orchadian.* You will be pleased to know that *The Orchadian* is regarded very highly both in Australia and overseas in botanical circles. Thanks also to Mr Don Blaxell for his help and advice on matters of botanical contention and to Mr Garry Wells for his excellent photography.

In conclusion I thank Mr Lloyd Bradford for his continued help as the Registrar of Judges and all those on Council for their unstinting efforts during the past year, and I wish A.N.O.S. and its members a successful new year.

JIM WALKER
President

Statement of Receipts and Payments for the Year Ended 30th June, 1980

RECEIPTS

	1979/80 $	1978/79 $
Membership Subscriptions	4,354.10	2,883.92
Bank Interest on Deposit	109.69	228.36
Sale of Badges	50.00	76.00
Sale of Orchadian — Back Issues	1,359.71	1,102.25
Sale of Check List of Hybrids	51.50	87.95
Sale of Books	—	876.30
Donations	27.70	170.67
Advertising		
Inserts in Orchadian	—	56.40
Advertisements in Orchadian	523.78	793.00
Flasking Service and Sales	—	412.25
Miscellaneous	260.84	312.19
Reprints Vol. 1 of Orchadian — Advance Sales	345.60	—
	7,082.92	6,999.29
Cash at Bank 1/7/79	2,588.55	2,522.83
	$9,671.47	$9,522.12

PAYMENTS

	1979/80 $	1978/79 $
Orchadian Printing, Postage, etc.	5,871.39	4,518.89
Secretarial — B. & C.	1,089.88	433.00
Advertising	150.30	40.20
Affiliation Fees	16.00	16.00
Miscellaneous Expenses		
Postage	205.00	160.00
Purchase of Filing Cabinet	102.20	—
Typewriter Hire	50.00	100.00
Post Office Box Hire	32.00	30.00
Printing, Copying, etc.	166.76	270.56
Bank Charges	11.00	10.00
Flasking Payout	183.00	336.00
Purchase of Books	—	723.13
Refunds for back issues of Orchadian not available	226.39	—
Insurance Premiums	58.88	27.40
Badge Purchases	195.60	—
Judging Course	—	268.39
	8,358.40	6,933.57
Cash at Bank 30/6/80	1,313.07	2,588.55
	$9,671.47	$9,522.12

In addition to the above Cash on Deposit — Publishing Account,
Interest Bearing Term Deposit with Bank of N.S.W. $1,500.00.

E. HUSTED, Treasurer (Honorary)

AUDITOR'S REPORT

In my opinion the above Statement of Receipts and Payments for the year ended 30th June, 1980 is properly drawn up and is in accordance with the books of account of the Society, and gives a true and fair view of the cash position at 30th June, 1980.

KENNETH OSBORN — Honorary Auditor

Who's Who

THE AUSTRALASIAN NATIVE ORCHID SOCIETY OFFICERS AND GROUP CONTACTS:

A.N.O.S. Council:
President: J.A. Walker; Vice-President: E. Gordon; Secretary: D. de Silva; Asst. Secretary: Nola Martin; Treasurer: E. Husted; Editor: J.J. Betts; Asst. Editor: P. Weston; Councillors: M. Harrison, F. Martin, F. Pierce, G. Wells.

A.N.O.S. Group Officers and Affiliated Societies extensively interested in Native Orchids:

NEW SOUTH WALES

- *Sydney Group:* Tel.: (02) 53 5956
  Meets 8 p.m. 2nd Friday each month, Ryde School of Horticulture, 59 Parkes Street, West Ryde.
- *Warringah Group:* Tel.:(02) 99 2468
  Meets 8 p.m. 2nd Thursday, Stony Range Flora Reserve, Pittwater Road, Dee Why.
- *Newcastle Group:* Tel.: 48 9109 — Meets 4th Wednesday, John Young Community Hall, Thomas Street, Cardiff.
- *Wollongong & District:* Secretary: Mrs E. Beileiter, 19 London Street, Berkeley, 2506.
  Meets 2nd Tuesday at the Meeting Room of the Wollongong Town Hall.
- *Hastings Valley Group:* Tel.: Wauchope 856 — Meets 7.30 p.m. 4th Friday at Uniting Church Hall, Wauchope.
- *Central Coast Group:* Tel.: (043) 41 7519
  Meets 7.30 p.m. 2nd Wednesday at the Baptist Church Hall, Cnr. York & Frederick Streets, East Gosford.

VICTORIA

- *Victorian Group:* Tel.: (03) 754 6585
  Meets 8 p.m. 1st Friday at the National Herbarium, Royal Botanic Gardens, Melbourne.

QUEENSLAND

- *Darling Downs Group:* Secretary: Mrs J. Leyden, 66 Mort Street, Toowoomba, 4350. Tel.: (076) 34 2813
  Meets 7.30 p.m. 3rd Friday at the Auditorium of the Technical & Further Education Centre, Old Empire Theatre, Neil Street, Toowoomba.
- *Native Orchid Society of Queensland (Affiliated):* c/- P.O. Box 159, Broadway, Qld. 4000.
  Meets 8 p.m. 1st Monday at Bread House, 49 Gregory Terrace, Brisbane.

SOUTH AUSTRALIA

- *Native Orchid Society of South Australia (Affiliated):* Secretary: E.R. Hargraeves, 1 Halmon Avenue, Everard Park, 5035 Tel.: (08) 293 2471 or 297 3724 — Meets 4th Tuesday, St. Matthew's Hall, 67 Bridge St., Kensington.

WESTERN AUSTRALIA

- *W.A. Native Orchid Study and Conservation Group (Inc.) (Affiliated):* Tel.: (09) 337 9614
  Meets 3rd Wednesday at the Department of Agriculture's Film Room, Jarrah Road, South Perth.

NORTHERN TERRITORY

- *The Orchid Society of the Northern Territory (Affiliated):* Secretary: Mrs G. Heinemann, Tel.: 85 4624,
  P.O. Box 38493, Winnellie, N.T. 5789

AFFILIATED SOCIETIES

Berowra & District Orchid Society
Blue Mountains & District Orchid Society
Brisbane Orchid Society
Bundaberg Orchid Society
Cumberland Orchid Circle
Hastings River Orchid Society
Illawarra & District Orchid Society
Manawatu Orchid Society (New Zealand)
Manning River Orchid Society
Maroochydore Orchid Society
Maryborough & District Orchid Society
Newcastle Orchid Society
North Brisbane Orchid Society
Northern & Eastern District O.S. (South Australia)
Orchid Society of Papua New Guinea
Sutherland Orchid Society
Tasmanian Orchid Society
Toowoomba Orchid Society
Tully & District Orchid Society
Tweed District Orchid Society

THE WESTERN REGION AUSTRALIAN NATIVE ORCHID CHAMPIONSHIPS

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Photos for the Photographic Section may be sent to the Secretary, Blue Mountains and District O.S. These will be returned after the show.

Further details and schedule may be obtained from Mr M. Wilde, Lot 4 Singlesridge Rd., Winmalee, N.S.W. 2777. Phone: (047) 54-1436.

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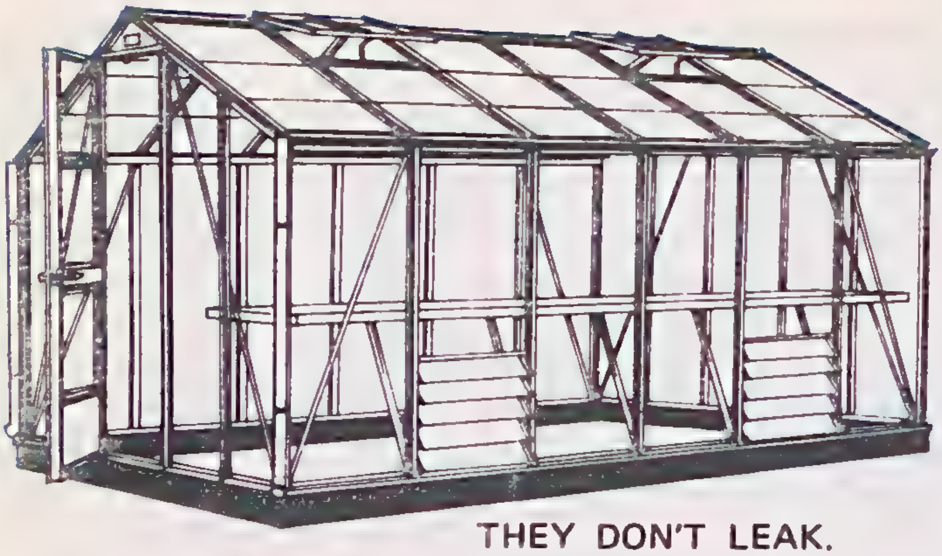

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Journal of the
Australasian
Native
Orchid
Society

Patron: James H. Willis

The Orchadian

Dedicated to the study and care of
Australasian indigenous orchids.

Dendrobium kingianum Bidw.

DECEMBER, 1980

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Officers of A.N.O.S. Council:
President: J.A. Walker
Secretary: D. de Silva
Treasurer: E. Husted

Please address all correspondence on membership, change of address, subscriptions, back issues of *The Orchadian* to: –

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Sydney, N.S.W. 2001

On all editorial and advertising matters, announcements by Groups, Affiliates, etc. please write to: J.J. Betts, 33 Memorial Avenue, St. Ives, N.S.W. 2075.
Articles should be typed in duplicate preferably on A4 size paper; double spaced with 4 cm or more lefthand margins.

A.N.O.S. Annual Membership is $7.00 which includes family membership and covers four issues of this journal.

Available from the Secretary at $2.00 each (overseas Aust.$2.50) are A.N.O.S. badges depicting the blue sun orchid, *Thelymitra ixioides.*

Local Groups of A.N.O.S.
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- Warringah
- Hastings Valley
- Newcastle
- Wollongong
- Darling Downs (Qld.)
- Victoria
- Central Coast

Affiliated Societies
- Blue Mountains & District O.S. (NSW)
- Native O.S. of Queensland
- Native O.S. of South Australia
- W.A. Native Orchid Study & Conservation Group (Inc.)
- O.S. of Northern Territory
- Others are listed by States inside the back cover.
- Societies may affiliate by subscribing to *The Orchadian* — which includes membership of A.N.O.S.

Date this issue distributed:
15th January, 1981

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BACK ISSUES of *The Orchadian*:
See details on back cover of this issue.

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THE ORCHADIAN

Founded August, 1963

Editor: J.J. Betts
Honorary Associate Editors: Dr N.J. Grundon (Qld.), Mr J. Simmons (S.A.)

Volume 6 December, 1980 No. 10

EDITORIAL

ANOS REPRESENTATIVES

At its October meeting 1980, ANOS Council resolved to establish a system of communication with members through ANOS Representatives nominated by Groups and Affiliates. This is similar, in principle, to the system recently adopted by the American Orchid Society in which "Affiliated Society Presidents have been asked to appoint an A.O.S. Representative. This liaison, dealing on a regular basis with the Committee on Affiliated Societies, the Membership and Public Relations Committee (etc.) . . . and armed with all pertinent information on the A.O.S. and its services, should be helpful in strengthening ties between the national and local orchid societies."
(A.O.S. Bulletin, April, 1980, p. 387)

As the Editor of the A.O.S. Bulletin warns, there is a danger that ". . . Things fall apart; the centre cannot hold . . ." If this danger applies to the A.O.S. with its enormous membership, it may not apply to the comparatively small but growing ANOS. Nevertheless, Council's decision was based on the idea of reducing remoteness of the national body from local Groups. If you have any questions about ANOS why not ask the President of your Group or Affiliated Society about the possibility of nominating an ANOS Representative, who will keep in touch with the centre? Representatives would become well-informed of central plans and activities and would keep the central body aware of local interests. Perhaps more importantly for *The Orchadian* and its future development they could build up the membership of the central ANOS through their close contact with new enthusiasts in the local areas who may not be aware of what ANOS can offer through its quarterly journal. For this purpose, representatives would be supplied with adequate copies of the ANOS brochure on our aims together with membership application forms.

For Contributors requiring reprints of their articles: —
We have found that it is more economical to provide copies of the full issue of *The Orchadian* containing the article than to order separate extracts from the printer later. Provided that the contributor orders the number of extra copies required *before the issue is printed* we are able to supply them at 80 cents (Australian) each plus cost of postage. So please inform the Editor of your needs at the time of submitting your articles for publication.

FEED-BACK AND FOLLOW-UP

- In the September issue I mentioned some interesting developments in South Australia concerning man-made terrestrial orchid hybrids. We can look forward to future articles from Les Nesbitt, Bob Bates and Ray Nash. Meanwhile I must quote a sobering note from R. Datodi in the Bulletin of the ANOS Victorian Group (April, 1980 p.5): "Unfortunately not many people are successfully growing our more difficult terrestrials and a shift of interest from species to hybrid growing could bring an end to some of our orchid species." After referring to the natural vigour of hybrids, he asks: **"Would these hybrids take over and replace other orchids if they got loose in the wild? Are they also going to add confusion to the already difficult task of identification?"**

LETTERS TO THE EDITOR

Dear Sir,

I note in the excellent article by B.J. Wallace, "Cantharophily and the Pollination of *Peristeranthus hillii*" (*The Orchadian*, Vol. 6, No. 9, p. 214, Sept. 1980) a reference to "the pollination of *Prasophyllum gracile* by a small beetle, *Trogoderma adelaidae* (family *Chrysomelidae*) . . ." May I draw attention to the fact that there is some confusion here, for the genus *Trogoderma* is at present placed in the family *Dermestidae* which itself is placed in a different superfamily from that which contains the *Chrysomelidae.*

Yours sincerely,
H.B. Wilson
7 Elm Street
8 September, 1980 Surrey Hills, Vic. 3127

◆ ◆ ◆

Dear Sir,

The Opening and Closing of *Thelymitra* Flowers —

Can the flowers of *Thelymitra* species be induced to open, or to stay open, by artificial means? I have seen *Thelymitra* plants exhibited at night, with closed blooms; and this is disappointing because many species have attractively coloured flowers.

I have a specimen of a *Thelymitra,* the 30cm stem of which carries 8 — 10 sky-blue flowers up to 27mm across the tips of the petals. It thrives and multiplies freely in a friable loam in pots, with occasional applications during the growing season of a complete fertiliser containing trace elements.

I have observed that when the plant flowers in September the flowers open usually an hour or two after sunlight falls on the plant; and that the flowers close at dusk. However, on dull days when the flowers remain closed I have tried to induce them to open by: —

(a) keeping them in a darkened room, heated by an electric radiator to about 32°C, and
(b) illuminating the flowers with a 100-watt electric light bulb, which also raised the temperature, with the bulb almost in contact with the flowers, to 32°C.

Neither treatment caused the flowers to open even slightly, although they were exposed to these high temperatures and the strong illumination for a considerable time. Because the flowers of this *Thelymitra* specimen close at dusk when the light intensity and the temperature decrease and the atmospheric relative humidity rises, it would seem reasonable to assume that the flowers would open as the light intensity and temperature increased and the relative humidity decreased.

I have been told by two experienced orchid collectors, that in the experience of each the closed flowers of *Thelymitra* collected in the field have opened after some time in the closed warm dark boot of a car. Possibly different species react differently. Possibly a daylight type of electric lamp, with which I have not experimented, would have some effect. I should be greatly interested to hear of any other observations or experiences with the opening and closing of *Thelymitra* flowers.

Yours sincerely,
H.B. Wilson
7 Elm Street
17 November, 1980 Surrey Hills, Vic. 3127

(cont'd. page 229)

TWO NEW SPECIES OF *DENDROBIUM* SECTION *LATOURIA* FROM THE MOUNTAINS OF PAPUA NEW GUINEA

by T.M. Reeve

Section *Latouria* orchids of the genus *Dendrobium* are a horticulturally attractive group occurring mainly in New Guinea and nearby islands. Most species grow in the mountains with only few being commonly found at sea-level; for example, *D. bifalce* and *D. macrophyllum.* Several of the mountain species have a widespread distribution, in Papua New Guinea at least, and could be regarded as common; for example, *D. finisterrae, D. johnsoniae, D. otaguroanum, D. rigidifolium, D. spectabile* and *D. terrestre.* Others have been discovered only in isolated pockets but grow in widely separated areas where they are often locally abundant; for example, *D. atroviolaceum, D. cruttwellii, D. dendrocolloides, D. engae, D. eximium, D. fantasticum, D. forbesii* and *D. polysema.* It is likely that further expeditions will show that these species are more widespread in their distribution than is currently believed.

Lastly, there are a few section *Latouria* species apparently with very limited distributions, which so far have been recorded only from a single area, for example, *D. curvimentum, D. hodgkinsoni, D. pleurodes* and *D. torricellense.* Considering this pattern of distribution it is not surprising therefore that some species have almost escaped the attention of collectors and botanists in the past and have remained undescribed. In this article two orchids belonging to this last category are named and described for the first time. Both have apparently quite limited distributions and both are little known in cultivation.

1. Dendrobium kauldorumi

Dendrobium kauldorumi T.M. Reeve sp. nov. *Dendrobium otaguroano* A.D. Hawkes simile aliquantum sed plantis majoribus robustioribusque, petalis angustioribus multo et labello trilobato perspicue, differt.

Herba epiphytica robusta erecta usque ad 45cm alta; *rhizoma* brevissimum; *radices* crassae, flexuosae, glabrae, circa 1.0—1.5mm diametro, *pseudobulbi* basi tumidi leviter, fusiformes usque ad clavatos, sulcati longitudinaliter demum, brunnei, circa 10 nodis, 3—40 x 1.0—2.3cm, foliis 2—3 apice. *Folia* erecta vel semierecta, elliptica vel ovato-elliptica, acuta, glabra, coriacea, viridia aliquando ex purpureo-rubra suffusa, 3.5—10 x 1.3—4.8cm. *Inflorescentia* terminales vel subterminales, 3—15 floribus, pedunculo 9—16cm longo, rhachidi 1.2—7.5cm longa; *bracteae* parvae, ovato-triangulares, acutae vel acuminatae, 0.4—0.7 x 0.2—0.3cm. *Flores* mediocres,glabri,circa 2cm diametro, tepalis albis; *sepalo dorsali* anguste triangulari, acuto, 1.2—1.9 x 0.4—0.6cm; *sepalis lateralibus* oblique angusteque triangularibus, acutis, 1.3—2.0 x 0.4—0.6cm; *petalis* anguste obovato-spathulatis, acutis, 1.3—2.0 x 0.35—0.55cm; *labello* valde articulato cardine, trilobato, callo mediano bicarinato non alto, viride pallide, venis extremoque distali calli atrovirenti, metiente expanso 2.0—2.3 x 1.4—1.7cm; *lobis lateralibus* obliquis oblongis, obtusis, circa 1.0 x 0.6cm; *lobo intermedio* ovato, acuto usque ad apiculatum, circa 1.0 x 0.85cm. *Columna* typica pro sectione, circa 4 x 3.5mm, pede columnae 5.5—7mm longo; polliniis 4, aureis. *Ovarium* glabrum, verrucosum leviter aliquando, circa 7mm longum, *pedicello* circa 2.0cm longo.

Robust erect epiphytic herbs up to 45cm tall. *Rhizome* extremely short. *Roots* thick, flexuous, glabrous, approx. 1.0—1.5mm diameter. *Pseudobulbs* slightly swollen at base, fusiform to clavate, becoming vertically grooved with age, brown, approx. 10 nodes, 3—40 x 1.0—2.3cm, with 2—3 leaves at the apex. *Leaves* erect to semi-erect, elliptic to ovate-elliptic, acute glabrous, leathery, green, often suffused with purple-red, 3.5—10 x 1.3—4.8cm. *Inflorescences* terminal or subterminal, 3—15 flowered, peduncle 9—16cm long, rhachis 1.2—7.5cm long. *Bracts* small, ovate-triangular, acute to acuminate, 0.4—0.7 x 0.2—0.3cm. *Flowers* medium-sized, glabrous, approx. 2cm diameter, tepals white. *Dorsal sepal* narrowly triangular, acute, 1.2—1.9 x 0.4—0.6cm. *Lateral sepals* obliquely and narrowly triangular, acute, 1.3—2.0 x 0.4—0.6cm. *Petals* narrowly obovate-spathulate, acute, 1.3—2.0 x 0.35—0.55cm. *Labellum* strongly hinged, 3-lobed, with shallow 2-ridged median callus, light green with veins and distal end of callus darker green, expanded (flattened) measurements 2.0—2.3 x 1.4—1.7cm. *Lateral lobes* oblique oblong, obtuse, approx. 1.0 x 0.6cm; *Mid-lobe* ovate, acute to apiculate, approx. 1.0 x 0.85cm. *Column* typical of the section, approx. 4 x 3.5mm, column foot 5.5—7mm long, pollinia 4, golden yellow. *Ovary* glabrous, sometimes slightly warty, approx. 7mm long. *Pedicel* approx. 2.0cm long.

Holotype: *T.M. Reeve* 311 in LAE. Sinasina District, Chimbu Province, P.N.G.; 2000 metres. Sept. 1979.
Isotypes: K, L, E, CBG, UPNG, AMES, NSW, BISH, BO.
Local Name (*Sinasina*): Sipabu.

Dendrobium kauldorumi is somewhat similar to *D. otaguroanum* (* See footnote) but differs in the larger, more robust plants, in the much narrower petals, and in the labellum which is distinctly 3-lobed.

This species has been collected so far only from adjacent parts of the Chimbu and Eastern Highlands Provinces of Papua New Guinea where it grows as an epiphyte on *Nothofagus* trees between 1800 and 2200 metres above sea level. It is a plant almost unknown in cultivation but it has been collected and grown in the past by Mr L.K. Searle (formerly of Kundiawa), Mr V.A. Chadim (formerly of Goroka) and Rev. N.E.G. Cruttwell (presently living in Goroka). Although the individual flowers are not large in size, a plant in full bloom is quite a pretty sight. Flowering appears to be non-seasonal with some plants coming into flower several times a year. The flowers last 3 to 4 weeks and are sometimes self-pollinating. The seed pods take 4 months to mature. At Laiagam *D. kauldorumi* grows well in pots and baskets as well as on *Nothofagus* posts.

This species is named in honour of Mr Kaul Dorum who accompanied me on the special patrol to collect the set of type specimens in 1979, and who has also contributed much to the establishment of the Highland Orchid Collection at Laiagam.

2. Dendrobium tapiniense

Dendrobium tapiniense T.M. Reeve sp. nov. *Dendrobio finisterrae* Schltr, *D. macrophyllo* A. Rich. et *D. polysematis* Schltr simile sed ab illis tribus speciebus differt floribus glabris omnino et lobo medio labelli emarginato profunde.

Herba epiphytica robusta erecta usque ad 60cm alta; *rhizoma* brevissimum; *radices* crassae, flexuosae, glabrae, 1.5—3mm diametro; *pseudobulbi* crassi, basi tumidi leviter, fusiformes usque ad clavatos, sulcati valde, brunnei diluti usque ad fuscos, circa 9 nodis, 3—50 x 1.7—3.5cm, foliis 2—3 apice. *Folia* erecta vel semi-erecta, ellipticis vel ovato-elliptica, acuta, glabra, coriacea, viridia aliquando ex purpureo-rubiginosa suffusa, 8—20 x 3.7—8.5cm. *Inflorescentiae* terminales vel subterminales, 3—15 floribus; pedunculo 6—12cm longo, rhachidi 4—12cm longa; *bracteae* ovato-triangulares, acutae, 0.5—0.9 x 0.4—0.6cm. *Flores* magni, carnosi, glabri, late aperientes, circa 3.5—4.5cm diametro, tepalis eburneis, punctatis maculisque purpureis intra extusque; *sepalo dorsali* ovato, obtuso, 2.4—2.8 x 1.4—1.7cm; *sepalis lateralibus* ovatis oblique, acutis usque ad obtusa, 1.8—2.2 x 1.7—2.0cm; *petalis* oblongis, spathulatis aliquantum, acutis ad obtusa, marginibus subundulatis, 2.2—2.6 x 0.9—1.1cm; *labello* valde articulato cardine, trilobato, callo mediano prominente tricarinato, duobus carinis extus procurrentibus sursum et carina obtriangulari transversali infra callum principalem, virido-flavo purpureimaculato, metiente expanso circa 3.0 x 4.0cm; *lobis lateralibus* columnam ambientibus apicibus imbricatis vulgo, subcuneiformis, 1.8—2.2 x 1.8—2.0cm; *lobo intermedio* emarginato profunde ergo labello aspectu quadrilobata, marginibus undulatis; duobus sectionibus late spathulatis 1.4—1.6 x 1.6—1.8cm. *Columna* typica pro sectione, alba suffusa purpurata, circa 7mm longa, pede columnae 1.2—1.4cm longo; anthera eburnea; polliniis 4, aureis, 2mm longis. *Ovarium* crassum, tricostatum subtriangulare in sectione transversali, ovarium cum pedicello 3.0—4.5cm longum.

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* **Footnote:** *Dendrobium otaguroanum* A.D. Hawkes in Lloydia 20 : 122 (1957). This name, proposed by A.D. Hawkes in 1957, replaces the name *D. chloroleucum* Schltr, a common section *Latouria* orchid from the highlands of P.N.G. The reason for the new name is that *D. chloroleucum* was used earlier by H.N. Ridley for a Malayan species. *D. otaguroanum* was written up and illustrated by Mr N.H.S. Howcroft in *The Orchadian* (December, 1977) Vol. 5, No. 10, pages 146-147 and readers should note the new name.

Robust erect epiphytic herbs up to 60cm tall. Rhizome extremely short. *Roots* thick, flexuous, glabrous, 1.5—3mm diameter. *Pseudobulbs* thick, slightly swollen at base, fusiform to clavate, strongly sulcate, pale to dark brown, approx. 9 nodes, 3—50 x 1.7—3.5cm with 2—3 leaves at the apex. *Leaves* erect to semi-erect, elliptic to ovate-elliptic, acute, glabrous, leathery, green, sometimes suffused purplish-maroon, 8—20 x 3.7—8.5cm. *Inflorescences* terminal or subterminal, 3—15 flowered, peduncle 6—12cm long, rhachis 4—12cm long. *Bracts* ovate-triangular, acute, 0.5—0.9 x 0.4—0.6cm. *Flowers* large, fleshy, glabrous, widely-opening, approx. 3.5—4.5cm diameter, tepals creamy-yellow with purple spots and blotches both inside and outside. *Dorsal sepal* ovate, obtuse, 2.4—2.8 x 1.4—1.7cm. *Lateral sepals* obliquely ovate, acute to obtuse, 1.8—2.2 x 1.7—2.0cm. *Petals* oblong somewhat spathulate, acute to obtuse, margins somewhat undulate, 2.2—2.6 x 0.9—1.1cm. *Labellum* strongly hinged, 3-lobed, prominent median callus of 3 ridges with outside 2 projecting upwards and V-shaped transverse ridge below the main callus, greenish-yellow with purple markings, expanded (flattened) measurements approx. 3.0 x 4.0cm. *Lateral lobes* surrounding the column with apices usually overlapping, subcuneiform, 1.8—2.2 x 1.8—2.0cm. *Mid-lobe* deeply emarginate giving the labellum the appearance of being 4-lobed, margins undulate; 2 sections broadly spathulate, 1.4—1.6 x 1.6—1.8cm. *Column* typical of the section, white suffused with purple, approx. 7cm long, column foot 1.2—1.4cm long; anther creamy-white; pollinia 4, golden-yellow, 2mm long. *Ovary* thick, 3-ribbed almost triangular in cross-section, ovary with pedicel 3.0—4.5cm long.

Holotype: *T.M. Reeve* 315 in LAE. Woitape, Goilala District, Central Province, P.N.G., 1500m. January, 1980.
Isotypes: K, L, E, CBG.
Paratypes: *G.H. Slade* s.n. in LAE! Tapini, Goilala District, Central Province, P.N.G., 6000 ft. January, 1967.
G.H. Slade s.n. in K! Tapini, Goilala District, Central Province, P.N.G., 6000ft. Mar. 1966

Dendrobium tapiniense is similar to *D. finisterrae* Schltr, *D. macrophyllum* A. Rich. and *D. polysema* Schltr (they are very difficult to distinguish when not in flower), but differs from those 3 species in the entirely glabrous flowers and in the labellum mid-lobe which is deeply emarginate.

This species has been known for many years, being collected at Tapini in the mountains of Central Province, Papua, by Mr G. Hermon Slade, Mr G.C. Elworthy, and probably others as well. It was nicknamed *Dendrobium* "Tapini" and a photograph by G.H. Slade was published in the December 1961 issue of the *Australian Orchid Review.* So far this species has been found only in the Goilala District, both at Tapini and Woitape, and grows there between 1500 and 1800 metres above sea level. It appears to have a definite flowering season only being recorded in bloom from December to March. It is hoped that a visit can be made to Tapini in the forthcoming flowering season to obtain more information on this species as well as to collect further plants for study at Laiagam.

The flowers of *D. tapiniense* are amongst the most attractive in the section. Slade (1961) comments: "We came across a huge plant carrying hundreds of bold and unusually attractive flowers . . . this plant ranks among the best of them (Section *Latouria* species) for it has large flowers of a very showy character which are of about three months duration." Mr Slade also made mention of this species in a paper to the 4th World Orchid Conference at Singapore (October, 1963) and his comments are recorded in the March, 1964 issue of the *Australian Orchid Review.*

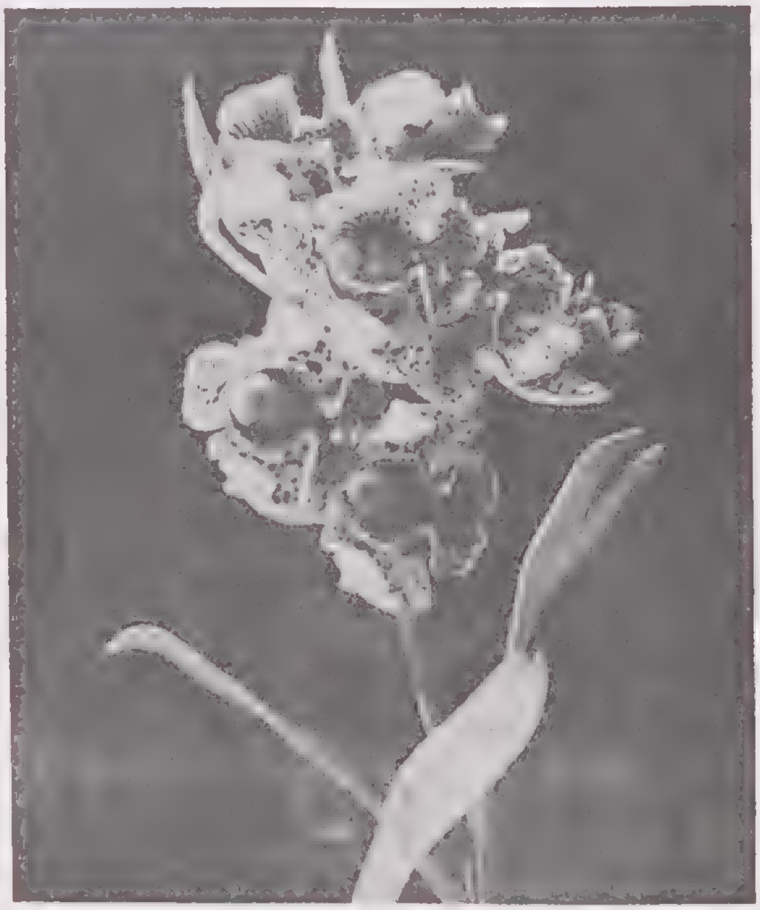
At Laiagam *D. tapiniense* has been in cultivation for only 15 months but it has exhibited vigorous root growth and it also flowers freely, even from small plants. These features, together with the impressive lip should make it a useful parent in hybridising programmes and it should also prove popular with species growers. This species does well both on slabs of tree-fern and in baskets of washed pine bark and charcoal. As with most members of section *Latouria, D. tapiniense* prefers plenty of breeze and sunlight.

Acknowledgement: The help of Mr J.J. Betts in preparing the Latin translations and in obtaining one of the references is gratefully acknowledged.

References:

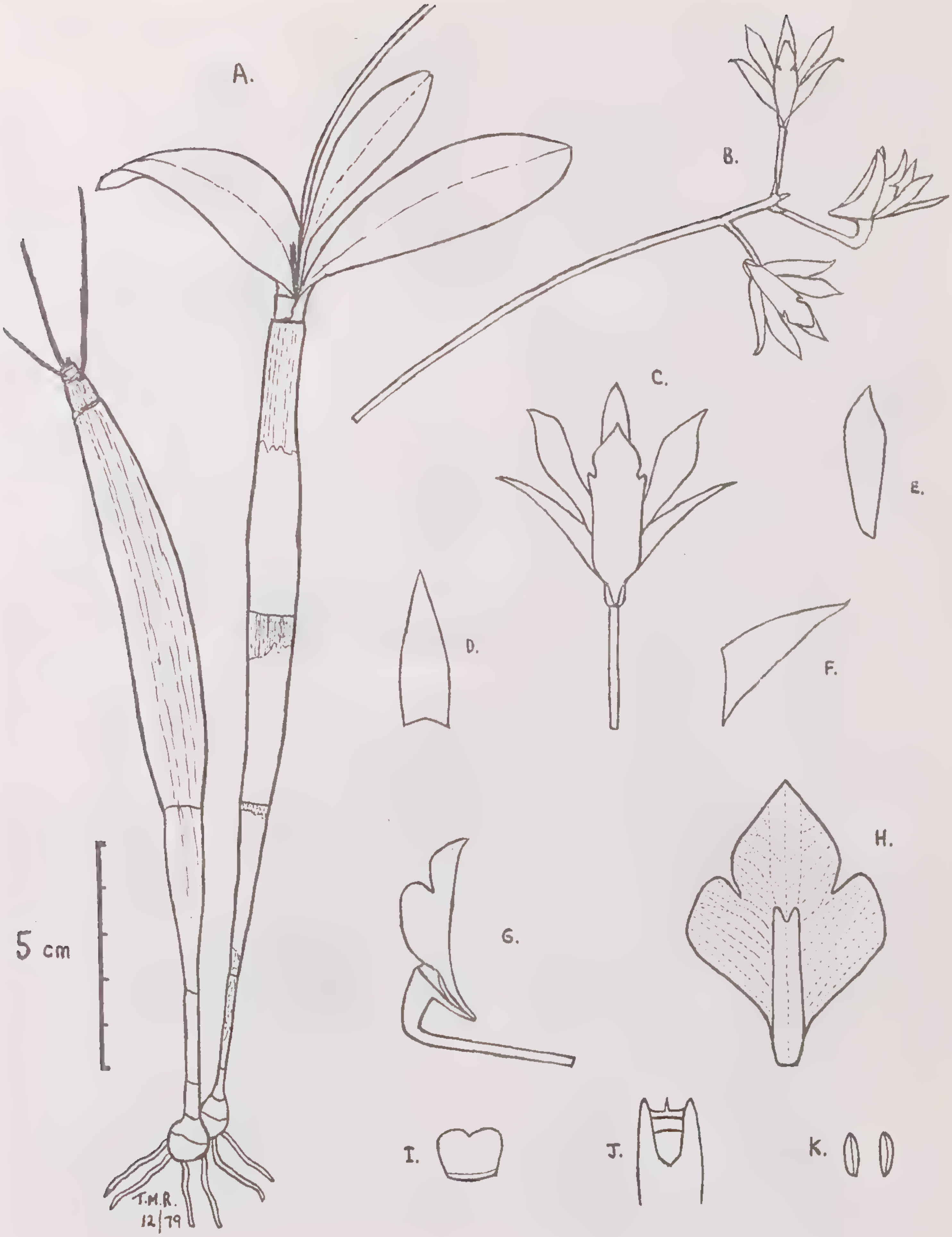
Slade, G.H. (1961): A Suggestion for the Holiday of a Lifetime. Australian Orchid Review 26 (4) : 179-180, 192. (Includes a black and white photograph of *D. tapiniense.*)
Slade, G.H. (1964): Collecting Dendrobiums in New Guinea. Australian Orchid Review 29 (1) : 21-24.

Laiagam, Enga Province
September, 1980 **PAPUA NEW GUINEA**



Dendrobium tapiniense From colour slide: T.M. Reeve

(For picture of *D. kauldorumi* see page 239.)



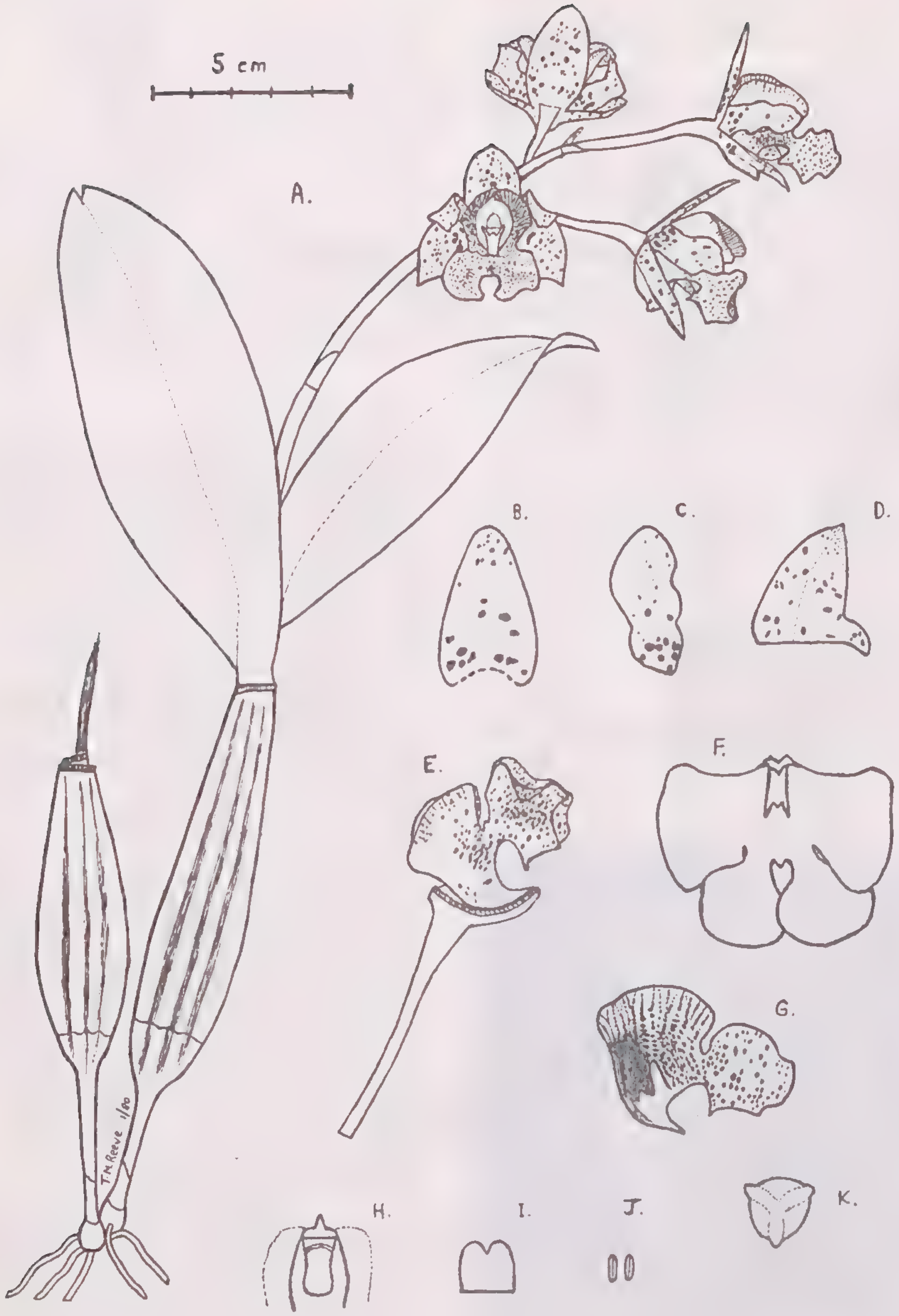
Drawing: T.M. Reeve

1. *Dendrobium kauldorumi* T.M. Reeve sp. nov.

A	Plant
B	Inflorescence
C	Flower
D	Dorsal Sepal
E	Petal
F	Lateral Sepal

G	Pedicel / ovary / column / labellum
H	Labellum (flattened)
I	Anther
J	Column
K	Pollinia

A, B	to indicated scale
C-G	to scale x 2
H	to scale x 3
J	to scale x 4
I, K	to scale x 8



Drawing: T.M. Reeve

2. *Dendrobium tapiniense* T.M. Reeve sp. nov.

A Small plant
B Dorsal Sepal
C Petal
D Lateral Sepal
E Pedicel / ovary / labellum
F Labellum (flattened)
G Labellum (Longitudinal section)
H Column
I Anther
J Pollinia
K Ovary cross-section
A to indicated scale; B-G to scale x 3/2; H-K to scale x 3

BOOK REVIEW

by J.S. Womersley

The Orchids of the High Mountains of New Guinea **P. van Royen 1980, being a reprint of pp 51 – 811, figs 41 – 278 of Vol 2, *The Alpine Flora of New Guinea,* 1979 published by J. Cramer, about A$ 100.00.**

The author, Pieter van Royen, has for many years sustained a deep interest in the flora of the high mountains of New Guinea. This interest is now culminating in the publication of *The Alpine Flora of New Guinea* of which Volumes 1 and 2 have appeared in 1979. Volume 1 of *The Alpine Flora* provides a detailed account of the geography, history of exploration of the high mountains, the vegetation of the high altitude regions, languages and native names — all contributed by the author. Of great significance to anyone interested in the biology of the higher regions of New Guinea are the specialist chapters by other authors: E. Löffler, Geology and Geomorphology; P. Bleeker, Soils; R.G. Barry, Climate; J.M.B. Smith, Plant Ecology and Origin, Affinities and Distribution of the High Altitude Flora; G.S. Hope, New Guinea Mountain Vegetation Communities and Historical Influences on the New Guinea Flora.

Volume 2 is the first of the volumes dealing with the taxonomy of the plants of the high mountains. The publication date is November 24th, 1979. The introductory pages include an extensive list of the abbreviations used for book and periodical titles used in the subsequent pages. Other general abbreviations of place names, measurements etc. and a very brief note purporting to explain the very unusual scales associated with the illustrations complete the introduction. This is followed by a taxonomic key to the families which have species occurring in the high mountain zone above 3000m above sea level. The taxonomic treatment of the Gymnosperms and Monocotyledons immediately follows in 1224 pages of which 760 are devoted to the Orchidaceae. It is this section which has been separately issued by the publishers as *The Orchids of the High Mountains of New Guinea,* 1980.

As *The Orchids* does not include the introductory material of Volume 2 of *The Alpine Flora* and, in so far as this material relates to *The Orchids* comment is relevant. Readers will be disadvantaged in not being able readily to interpret the literature references used; but even with the full list from Volume 2 it is disconcerting to find that Schlechter's *Die Orchidaceen von Deutsch Neu-Guinea* does not receive an entry unless one is aware that the original publication of that work is in the 'Beihefte' (Supplements) to *Fedde Repartorium Speciarum,* the entry for which is less than adequate. In the abbreviations of place names it is most disconcerting to find "Papua" being used for the Territory of Papua New Guinea, a name which ceased to exist with the independence of the nation of Papua New Guinea in September 1975. There is absolutely no excuse for the copy not having been corrected throughout by the replacement of "Papua" and "TNG" whereever occurring and substituting PNG standing for Papua New Guinea. To do otherwise is a gross discourtesy to a country which has made possible the opportunities for the author to carry out his field work.

The matter of the scales with the illustrations is most confusing. Each drawing is accompanied by a line with a figure. The notes in Volume 2 of *The Alpine Flora* tell us that all drawings have been prepared by the author and that the figure represents in millimetres the length of the line. This then has to be related to the relevant drawing. The system of using a standard length line of 5mm or 2cm which can then be enlarged or reduced with the illustration is to be preferred.

Publication of both *The Alpine Flora* 1979 and *The Orchids,* 1980 is by direct image offset from typescript in which four type faces have been used. The right hand margins have not been justified. The method of reproduction gives the impression of a hastily compiled, cheaply produced publication which is belied by the price, about A$65.00 for Volume 1, A$130.00 for Volume 2 and about A$100.00 for *The Orchids.* The typescript contains a number of spelling errors, some of which are included in "Corrections and Additions", Volume 2 which is being distributed with the full volume but was not included with the copy of *The Orchids.* In the acknowledgements in *The Alpine Flora* the author refers to the assistance of his wife, who is originally 'English speaking', in rendering his 'double Dutch' into understandable English. The reader will find that notwithstanding the very considerable work put in by Mrs van Royen the text is not always very readable.

The Orchids is provided with a brief Introduction which outlines the system of classification used by the author. Subfamily names follow those used by Dressler and Dodson and also by Garay. The subfamily *Neottioideae* includes species from 3 tribes and 4 genera with 13 species in all in the high mountain region. The *Orchidoideae* includes three genera with 4 species and the *Epidendroideae* 19 genera with 233 species. In all, van Royen covers 250 species of which 132 are described as new to science. He is recognised by many botanists as taking a very narrow view of species limits and this is no doubt reflected in the large number of new species. Reeve and Woods, *Orchadian* Vol 6, 9, p. 195, Sept. 1980, review the section *Oxyglossum* of the genus *Dendrobium* and recognise only two of the 16 new species created by van Royen in *The Orchids.* In the opinion of Reeve and Woods, van Royen has failed to appreciate the inherent variability of many of the high altitude orchids and this is no doubt the reason for his very narrow view of species limits and the creation of a large number of new species. On the other hand the technical description of the species is a model which could well be followed by other authors. Previously described species are provided with an extensive description in English based on the material currently available to the author and on previous descriptions. New species have a detailed diagnosis in Latin followed by a more detailed description in English. Each new species is accompanied by a plate of drawings which illustrate in detail the floral parts and growth form, falling short only in the nature of the scale used. The legend to each illustration provides reference to the collection(s) from which the drawing has been prepared — a highly commendable practice. In these matters the work is a model for others to follow.

The citation of the names of species actually described in *The Alpine Flora* has not been changed in *The Orchids.* All species which appear as "van Royen *nov.sp.*" in *The Orchids* should be cited as "van Royen *Alpine Flora New Guinea* (1979)" with the same page number.

On page 531 of *The Alpine Flora, Glomera subalpina* van Royen nov.sp. is described in English but the diagnosis in Latin, as required by the International Code of Botanical Nomenclature, has been omitted. The author advises that this is a publisher's error and that effective publication has been achieved by the inclusion of the Latin diagnosis in the "Additions and Corrections" leaflet that was published contemporaneously with, and distributed with, Volume 2 of *The Alpine Flora.* The correct citation of this species then becomes *Glomera subalpina* van Royen Alpine Fl. N.G. (1979) 531 and Add. & Corr.

Other points of significance to Australian orchidologists are, inter alia: —

1. *Pedilochilus* Schltr is maintained as a genus distinct from *Bulbophyllym* in that the number of pollinia in *Pedilochilus* is 2 whereas *Bulbophyllum* has 4 pollinia.
2. *Cadetia* is included as a subgenus of *Dendrobium.*
3. *Schlechteria* van Royen is proposed and validated as the name for *Eu-bulbophyllum.* The use of Eu- for subgeneric epithets does not accord with the International Botanical Rules.
4. By the same reasoning *Eugenanthe* is validated for the subgenus *Eu-dendrobium.*
5. van Royen provides detailed taxonomic treatments for the sub-genera of *Liparis* and *Oberonia* which have relevance to species of these genera occurring in Australia.

Other matters requiring comment are to be found in the Introduction to *The Orchids* where paragraph 2 is most misleading as 'subgenera' is twice used where sub-family is intended. Fortunately for the discerning reader the context makes the error stand out. On page 155 the page heading *Dendrobium* should be *Dendrobiineae.*

It is a matter of great regret that the author has apparently not seen the very extensive collections of orchids from the high altitude regions of New Guinea held in the Papua New Guinea National Herbarium at Lae. He appears to have relied on duplicate sheets of these collections held in other herbaria and ignored the unicates in Lae. These must be of considerable number. If he did see the Lae specimens some at least should have been used as 'types'. The selection of specimens in Kew (England) and Leiden (Holland) as types will make future work by indigenous botanists in Papua New Guinea more difficult than necessary. Critical appraisal of the author's work in the future will demand examination of his types. The selection of a few specimens held in Canberra is preferable in that these specimens from collections held in herbaria other than those in the country from which the plant originates is to be deplored. It is no wonder that countries wishing to develop their natural sciences create restrictions on the collection and removal of biological material. I certainly sympathise with the Indian biologists who repeatedly point out that all the important collections of their flora and fauna are held outside India — mainly in England. The same can be said for Papua New Guinea flora where well curated specimens are held in the National Herbarium at Lae.

The Orchids of the High Mountains of New Guinea represents an important step in documenting our knowledge of the orchid flora of the mountainous areas of New Guinea. It is certainly not a book providing useful information on the growing conditions of the plants. There are virtually no ecological notes. This volume will be relevant to the systematic orchidologist who has access to the larger herbaria in which the specimens cited are held. Such professional workers will no doubt attempt to persuade their Librarians that purchase can be justified. I would strongly recommend for such libraries Vol. 1 of *The Alpine Flora* as a valuable reference work to New Guinea even though it is grossly over-priced. I cannot recommend *The Orchid* for the amateur orchidologist or field naturalist.

82 Richmond Road
October, 1980 Westbourne Park, S.A. 5041

Dendrobium Beetle (*Stethopachys formosa* Baly) and *Cymbidium suave*

by Alan Rushton

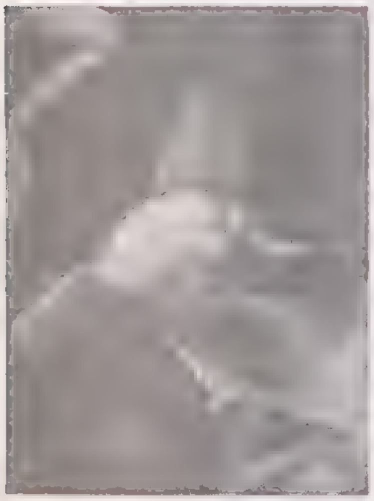
ANOS Central Coast Group

Most Native Orchid growers know well the orange and black beetle which attacks new growths and blooms, but the chrysalis from which the beetle emerges full size is probably not so familiar.

Over some years now, I have had a plant of *Cymbidium suave* attacked every flowering season, though rarely do I see the beetle that lays eggs in the open flowers. These go unnoticed until it is too late; and soon the spikes are invaded by yellowish slug-like grubs which, if left to complete the destruction, reduce the flowers to a revolting mass of glutinous slime in which they eat day and night, bathed in their own exretions.

Photo: A. Rushton

FIG. 1: Larva at work on a flower of *Cymbidium suave.*



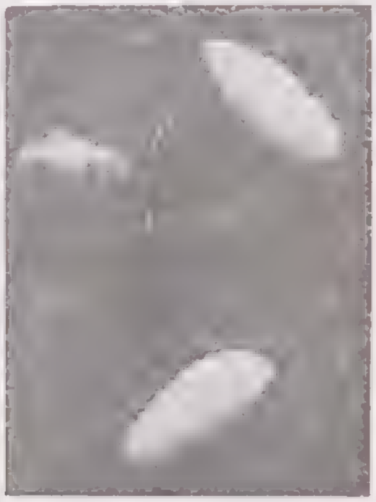


FIG. 2: Comparison of size — beetle with 2 full-grown larvae ready to pupate. Photo: A. Rushton

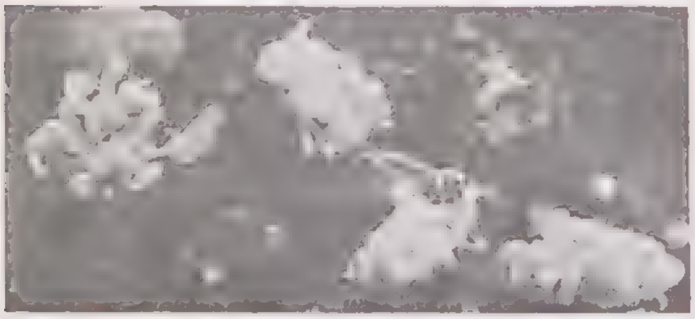


Photo: A. Rushton

FIG. 3: Larval cases or cocoons. These enclose living pupa or chrysalis. They are resting on compost in a 6" pot 21 days before hatching of beetles.

Last summer, November/December, 1979, instead of making the usual massacre in a bonfire, I kept a few larvae in a clear plastic canister inverted over a six inch pot of orchid compost and fed them fresh *Cymbidium suave* flowers daily. A work bench experiment to see how long and how big they grow. At maturity, about half an inch long or more, they lost interest in eating and made their way to the compost. An overnight transformation took place and the larvae now became chrysalids which resembled a small bundle of white waxy spaghetti-like substance about three quarters of an inch long.

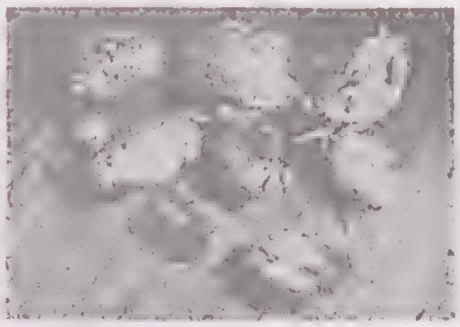


FIG. 4: The hatching stage. Photo: P. Collin

In due course full size dendrobium beetles emerged, all hatching out about the same time; and this completed the purpose of the exercise.

A further brood was raised over the same period in order to time the different stages. I discovered a mating pair of beetles one morning, hell bent on raising a family big enough to destroy my entire orchid collection. They did not seem to resent captivity and eggs were laid immediately on *C. suave* blooms and new *Dendrobium kingianum* shoots, supplied. The cycle started off from scratch to a generation of new beetles now under a calendar time-table.

From egg, through lava stage, to chrysalis: 15 days. Chrysalis, through dormant period, to new beetle: 21 days. A full cycle (egg to beetle) 36 days.

It would seem that two or more full cycles are possible in the warmer months and I presume the chrysalis stage transformation to beetle is slowed down over winter for a hatch in spring.

After egg laying the parent beetles were separated from the slimey mess of hungry grubs and fed on new *D. kingianum* leads and bulbs — one living for 20 days, and the female (slightly larger) 28 days.

Of their beetle offspring I kept two which proved to be incompatible, but they had not lost their appetites and devoured the *D. kingianum* leads — one for 60 days and the other 78 days; though I wished them dead long before this! Earlier, I tried changes of diet and proffered leaves of a weed called "Wandering Jew" and also *D. kingianum* leaves sprayed with a pressure-pack garden product. They were left untouched. The same spray did, however, kill the larvae by contact at close quarters, although a few in shelter under leaves, etc. lived.

So look out for waxy white spaghetti bundles !

I have seen some between the bulbs of *D. falcorostrum* under cultivation on fibre; also between hybrid cymbidium bulbs.

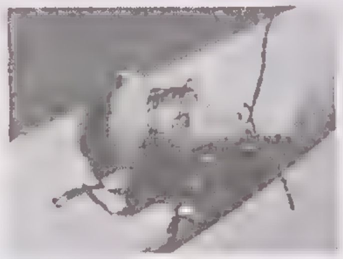


FIG. 5: The beetle. Photo: P. Collin

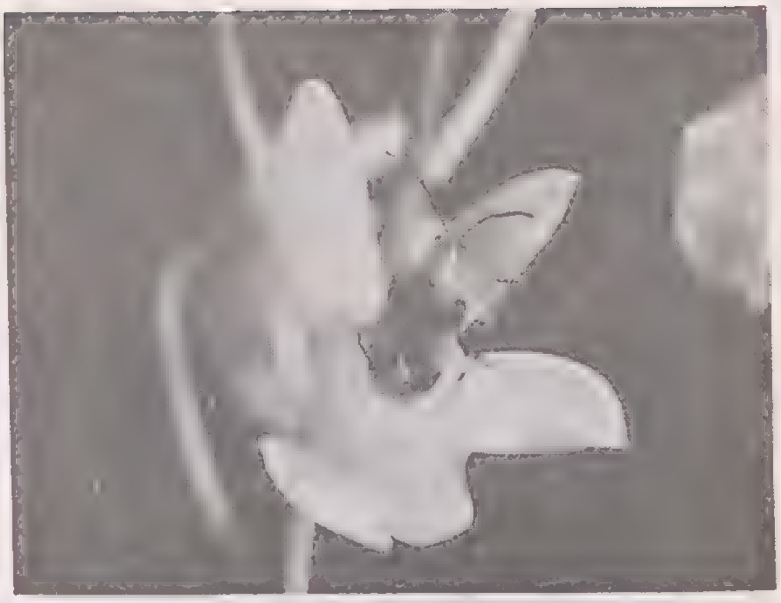


Photo: A. Rushton

FIG. 6: Dendrobium Bardo Rose under attack.

401 Ocean Beach Road
UMINA, NSW. 2257

9 May, 1980

FOOTNOTE by David K. McAlpine —

The Dendrobium beetle referred to in Mr Rushton's article was first described and named as *Stethopachys formosa* by Baly in 1860. Entomologists place it in the subfamily Criocerinae of the family Chrysomelidae — a very large family of plant-eating beetles. This species appears to be restricted to eastern New South Wales and Queensland, at least as far north as Cairns. The larva spins a silken cocoon, resembling that of many moth species, and pupates inside it. The adult beetle stridulates (squeaks) vigorously if handled and produces a foul-smelling secretion which probably gives it a degree of distastefulness to birds. Though its native food probably consisted of native species of *Dendrobium,* it attacks a wide spectrum of the orchid family. I have found it attacking a soft-cane dendrobium, the young shoots of a cattleya, the flowers of hybrid cymbidiums, and, once, the leaves of a diuris.

Little has been published about this insect but W.A. Smith (in *The Australian Orchid Review* pp. 46—48, 1940) has given some information on its life history and suggested some means of control. The recommended steps which would remain useful today would include searching out and destroying the beetles and larvae; and use of gauze to exclude them from the orchid house.

10 October, 1980 **The Australian Museum, Sydney**

Letters to the Editor *(cont'd. from p. 222)*

In response to a letter on 3 October, 1980, from Jim Kirkham of Kindee via Wauchope seeking identification of "a leafless climbing ground orchid" carrying 504 flower buds at the time of photography, we obtained the following from Mark Clements of the National Botanic Gardens, Canberra: —

The plant shown is *Galeola cassythoides* (A.Cunn.) Reichb. f. a species that inhabits the drier forests along the east coast of Australia, from Sydney to south eastern Queensland. It is easily recognised by the climbing habit of the inflorescence, leafless stems and cream to brown colourations of both stems and flowers. The other Australian representative of this moderately large genus (over 70 species) *Galeola foliata* (F.Muell.). F.Muell. is larger, has distinct large stem bracts, is green except for the orange & red flowers and it favours rainforests.

Both species are saprophytes deriving a greater part of their nutrient requirements from rotting wood. This is achieved with the aid of a wood rotting fungus with which they are always associated in the field. The fungus breaks down the wood, converts it to usable metabolites and these are then transferred to inside the orchid roots. Here the metabolites are absorbed by the orchid after digestion of part of the fungus. *G. cassythoides* is a true saprophyte because it lacks any chlorophyll while *G. foliata* is only partially saprophytic because it does manufacture some of its own food in the green areas of the plant.

Both species, however, are totally dependent on the fungus for germination. They may, upon germinating, spend several years underground as rhizomes prior to emerging for the first time to flower. What we see, in fact, are only the flowering parts of the plants.

— M.A. Clements

Dear Sir,

Growing Techniques — or Readers' Information Exchange

There seems to have been no response to Erhard Husted's "Open Letter to Growers" in *The Orchadian* of June, 1979.

I would like to tell of the potting mixes I use for my native orchids.

The terete forms of Dendrobium do not like their roots covered; so I have them growing on a few different mediums such as 4" x 2" well seasoned hardwood, palings, treefern, paperbark and cork. I like the cork best (the solid type) or casuarina.

To attach the orchids to the medium I use pantyhose in preference to nylon fishing line. By the time the pantyhose rots, the new roots have taken over.

The other forms of Dendrobium I have growing in pot culture with one exception: *D. tetragonum,* which I have on treefern blocks.

I have tried many different composts, but at present I am using two —

No. 1: equal amounts of 3/8"—½" bark and charcoal.
No. 2: bark only.

I prefer the latter because I believe the charcoal retains too much salt.

To cure the bark I am putting one bucket of fresh bark into a plastic garbage bin, adding half a big fruit tin or two handfuls of fowl manure, then half filling the bin with water and stirring two to three times a day for a week. After ladling out into a sieve to drain and dry, the mixture is stored in plastic bags.

Let us hear from readers who might have a better mix and better ideas than I have.

Good growing,
Fred Pierce

32 Hawkesbury Road
Westmead, NSW. 2145

10 November, 1980

KNOWING AND GROWING AUSTRALIAN SARCOCHILUS

(A general introduction to the species)

by David Banks

The genus **Sarcochilus** contains a number of South-East Asian species, fourteen being indigenous to Australia. Eleven of the species discussed here are epiphytic, while the other three are lithophytic. In Australia the range of the genus is along the east coast: from the tip of north Queensland through New South Wales and Victoria and into Tasmania. In this article I will discuss the species and habitats in summary form and then tell how I grow some of them. Some of our Australian native orchids have been classed as impossible to grow. I have proved that this is not entirely correct.

Sarcochilus australis (Lindl.) Reichb.f.

A small epiphyte with leaves up to 80mm long and 15mm wide, of a greenish-grey colour and purple underneath, with stems up to 60mm long. The roots are white, but brownish-green at the growing tips, thin and of a creeping habit. The racemes are up to 140mm long and hold up to 14 brownish-green fragrant flowers with a white labellum which is marked with purple, each flower being about 26mm from tip to tip and 15mm in diameter.

Sarcochilus australis flowers between October and December. This plant's range is from Tasmania, where it was originally discovered, through eastern Victoria and into New South Wales, where it is found as far north as Gosford on the central coast. It is very rare north of this point. This plant grows on twigs in moist gullies usually overhanging water. In Tasmania it grows in rainforests on rainforest trees.

I grow this species using a method of tying two pieces of hardwood together with sphagnum moss in between and then placing the plant on one piece. As it grows in shady gullies I grow it in a cool glasshouse in a corner with about 75% shade. I never water the plant itself, I keep the sphagnum moss just wet, and sometimes just dampen the roots. *Sarcochilus australis*, like almost every orchid, needs air movement to avoid a type of fungus that is fatal. The secret with this species and some of the others is to keep the plant dry but in a moist atmosphere.

Sarcochilus ceciliae F.Muell.

A small lithophyte found growing on sandstone cliffs and ledges, this plant forms small clumps and has leaves up to 70mm long and about 6mm in diameter. The roots are thick and tough, of a bone colour and are creeping. Stems are short but can reach a length of 10cm. Racemes are up to 15cm in length and carry up to 12 pink round flowers which point to the top of the raceme and are up to 8mm in diameter.

Sarcochilus ceciliae flowers between the months of November and February. The range is from the Hastings River in north-eastern New South Wales up to Cape York Peninsula, north Queensland.

This orchid is easy to grow. The main problem is scale, which, when not treated, kills the plant. The best way to get rid of scale is to get a mixture of 50% methylated spirits and 50% water, dip an old toothbrush in this and then scrub the infested areas. This kills the scale and does not harm the plant if the solution is washed off. I grow this species in terracotta pots, in a mixture of 50% sandstone and 50% charcoal. I let it dry right out between waterings. As only one or two flowers are out at a time, one flower spike will produce flowers for over three weeks. My plants receive 50% shade.

S. ceciliae var. albus T.E. Hunt

Plant form is the same as the type form, but the flowers are pure white and are fully open as in *S. hillii*, not bell-shaped as in *S. ceciliae var. ceciliae.* This variety is native to the New South Wales/Queensland border.

S. roseus Clemesha

Dockrill considers this a *subspecies* of *S. ceciliae* even though S.C. Clemesha (*Orchadian* 3 (1969) p. 35) raised it to the status of species.

In this variety the plants grow singly and not in clumps. The leaves are shorter, thicker and broader than the type form. The flowers are slightly larger and of a deeper colour, in the mauve shades.

This orchid is found around the Atherton Tableland in north Queensland. Flowers appear on the plant between October and January. Culture is the same as for the type form.

From colour photos:
G. Wells

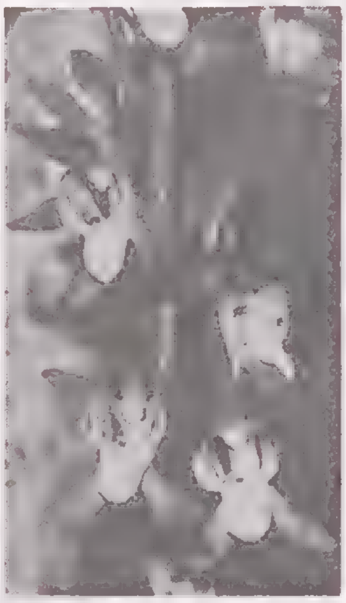


FIG. 1:
Sarcochilus australis

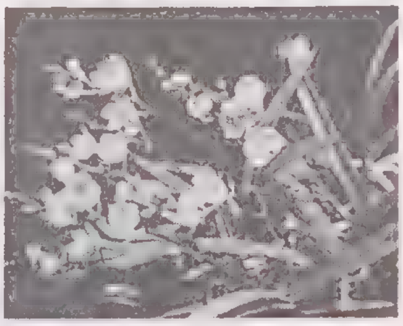


FIG. 2: *Sarcochilus ceciliae*

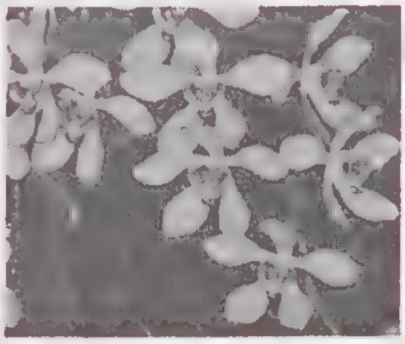


FIG. 3: *Sarcochilus falcatus*

Sarcochilus dilatatus F.Muell.

A small epiphyte, related to *S. olivaceus.* Leaves up to 60mm long and 8mm wide. Stems up to 40mm long. Racemes up to 70mm long which have up to ten flowers. The flowers are widely opening and are 20mm from top to bottom. The petals and sepals are pale green shading to deep brown at their distal ends. Labellum white with yellow markings.

A rare plant distributed from the Richmond River in north-eastern New South Wales to the Burnett River in south-eastern Queensland. Its habitat varies as it is mainly found in dryish scrub but has also been found in dense rainforests. The flowering season is September and October.

This plant is reputed to be hard to grow. Presumably it requires similar treatment as for *S. australis.*

Sarcochilus falcatus R.Br.

A semi-pendulous epiphyte with leaves up to 150mm long and 15mm wide, falcate, and of a pale green colour. Stems up to 180mm long but generally smaller. Racemes semi-pendulous, zig-zag in form, and around the same length as the leaves. The dead racemes are black. Up to 12 flowers per raceme, 20–35mm in diameter, white through to cream. A pink form has been discovered but is very rare. Labellum colour is white with orange and sometimes purple. Most forms have an orange-blossom fragrance; hence the common name: "orange blossom orchid".

S. falcatus is probably the most common of all the Sarcochilus species, being distributed from eastern Victoria through New South Wales and as far north as north Queensland on the Atherton Tableland. It grows on rainforest trees in areas where the soil is volcanic. The flowering season in north Queensland is June and July, but in New South Wales this plant flowers between the months of September and December. It grows in colonies.

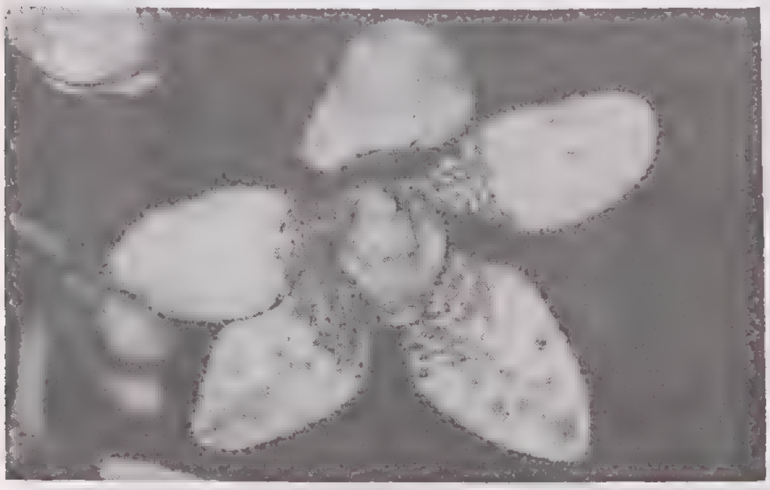
This orchid is easy to grow as long as the roots are not covered, as this will kill the plant within a few months, leaving the plant pitch black. It can be grown in 70% shade on a number of hosts. Cork bark is very good but hard to get. Most of my plants are grown using the method outlined for *S. australis.* When the plants come into bud, watch for snails and caterpillars. They love the taste of the buds.

Sarcochilus fitzgeraldii F.Muell.

A large plant (for the genus), lithophytic and growing into large mats. Leaves up to 140mm long, 12mm wide, dark green and fairly thick. Stems branched, up to 75cm, but usually much shorter. Racemes up to 20cm long, bear, up to 14 large, round flowers which are widely opening and up to 32mm in diameter. These flowers are pure white with a purple centre. There are some blotched or fully purple forms.

S. fitzgeraldii is the largest flowered of the genus and is distributed from the Macleay River, north-eastern New South Wales to the south-eastern area of Queensland. It usually grows on cliffs and ledges but most of the good forms are found in the deep, heavily shaded ravines.

This orchid is a good grower, but is shy to flower profusely. I grow it in terracotta pots in a mixture of chunks of sandstone and medium-sized pieces of pinebark. This is mixed at a ratio of 50/50. I keep my plants continually moist, but not wet. These plants receive 80% shade in summer and 60% in winter.



From colour photo: G. Wells

FIG. 4: *Sarcochilus fitzgeraldii*

Sarcochilus harriganae Rupp

Not much is known about this epiphytic species. This very rare orchid was found at Dorrigo in October, 1937. To my knowledge it has not been rediscovered since then. It may have been a natural hybrid between *S. olivaceus* and *Pteroceras spathulatus,* but this is doubtful. The following description is taken from Rupp's "Orchids of New South Wales" (p. 136): –

"A small plant with numerous roots, very similar to a small *S. falcatus* but the leaves usually, but not invariably, finely spotted. Racemes short, with few flowers, resembling those of *S. olivaceus,* but of a more opaque green."

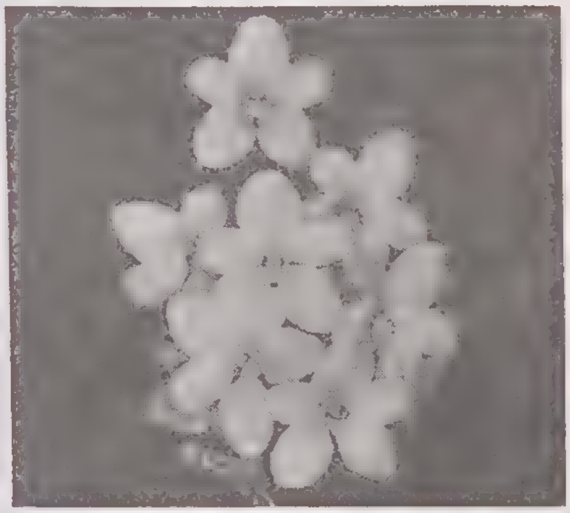
Apparently, Rupp himself wrote that the black spots did not reappear in cultivation and Mr Len Archer, when shown the original site of this species by members of the Harrigan family, found that plants had been marked by wasps which produced the black spots on the leaves. Probably not in cultivation.

Sarcochilus hartmannii F.Muell.

This species is closely related to *S. fitzgeraldii.* A lithophyte, it has leaves up to 16cm long and 15mm wide. Stems up to 60cm long but usually shorter. Racemes up to 26cm long which carry up to 26 densely packed pure white flowers, sometimes with deep maroon spots in the centre of the flower. Some forms are pure white with no spots. Flowers 16mm in diameter in the type form. *S. hartmannii* "Mt Lindsay" form and *S. hartmannii* "Blue Knob" form have flowers about 24mm in diameter. One, if not the largest, is *S. hartmannii* "Eric Marygold" which has flowers 30mm in diameter, larger than a 20 cent piece. *S. hartmannii* "Kerri" AM/AOC was 31mm.

S. hartmannii flowers between September and November. This orchid is distributed from the Hastings River in New South Wales as far north as the Atherton Tableland, North Queensland. It grows on exposed but moist cliffs, but sometimes near creeks in shady conditions.

S. hartmannii is the most commonly grown of Australia's Sarcochilus and is one of the most beautiful of them. It grows in our cool glasshouse, but will grow in a shady section of the bushhouse. I give my plants 50% shade all year round, using terracotta pots and a mixture of 40% sandstone (size of golf balls), 30% pine bark and 30% charcoal. *S. hartmannii* is the same as *S. fitzgeraldii* in liking pots crocked to about one third of the way up the pot for excellent drainage.



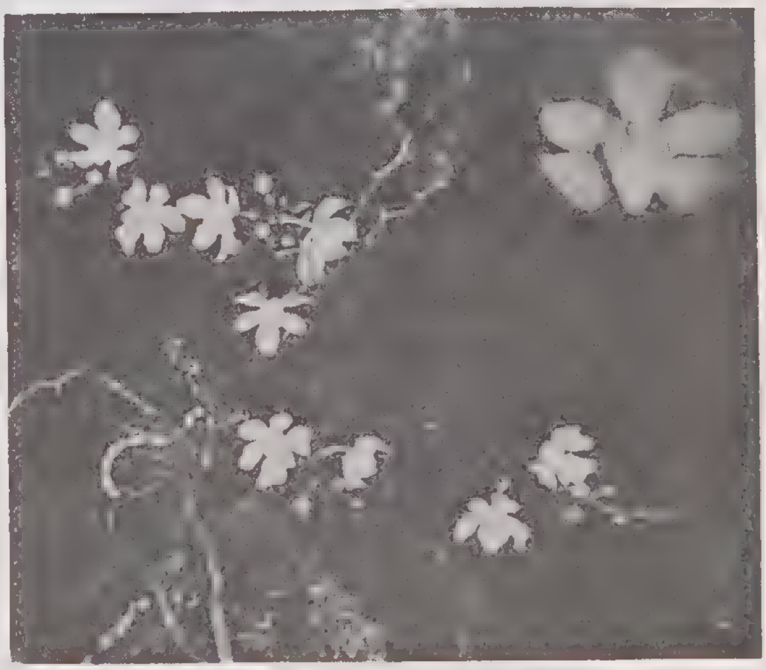
From colour photo: G. Wells

FIG. 5: *Sarcochilus hartmannii*

Sarcochilus hillii (F.Muell.) F. Muell.

A very small epiphyte, resembles *S. ceciliae* and could be mistaken for it when not in bloom. Leaves up to 120mm long, 3mm in diameter, dark green and spotted with purple. Stems short, up to 60mm long. The racemes are about the length of the leaves and bear up to 18, widely opening, frosty white to pale pink flowers which are 10mm in diameter. Roots numerous, often tangled, large for the size of the plant.

S. hillii flowers between October and January. This orchid is distributed from the south coast of New South Wales at least as far north as Rockhampton, north Queensland. It does not grow in rainforests, but in "dry scrub" overhanging water, on twigs. I grow this species on hardwood covered in paperbark, as its roots dig into the paperbark for moisture. I give this one about 55% shade but it doesn't receive much water. Like *S. falcatus,* it likes to be kept dry but in a moist atmosphere. The flowers only last a day or two but can be continually in bloom for quite a long period. As one lot of flowers fade and die, another will open.



From colour photo: G. Wells

FIG. 6: *Sarcochilus hillii* (Inset: close-up natural size)

Sarcochilus moorei (Reichb.f.) Schltr

This large epiphytic species has large leaves, 260mm long, 50mm wide. Plant habit is like that of *Phalaenopsis*. Racemes up to 50cm long which bear up to 50 flowers which are up to 25mm in diameter but only last for a day. The colour is an ochreous yellow which is blotched with brown. In nature all the plants of one colony flower the same day.

In Australia, this plant flowers between the months of July and September. *S. moorei* is recorded from the Cape York Peninsula and is common in New Guinea, New Britain and the Solomon Islands.

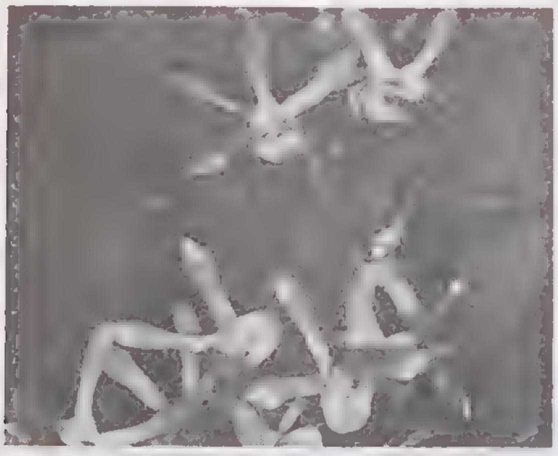
I grow this species in a cool glasshouse in the summer but in a heated one in the winter, kept at a temperature of 65°F – 70°F. This plant, as it grows in shady rainforests, receives 80% shade and is grown on a slab of treefern fibre which is watered when dry.

Sarcochilus olivaceus Lindl.

Sarcochilus olivaceus is an epiphytic orchid which grows on rainforest trees or sometimes on rocks. In the bush, I have seen this one growing on thick lianas. Leaves up to 14cm long and 20mm wide on stems up to 60mm long which are dark green. Racemes up to 12cm long which carry up to a dozen olive green flowers, 20mm in diameter, with a "spicy" fragrance. A pure yellow form has been recorded.

This orchid is distributed from Nowra in south-eastern New South Oales into Queensland as far north as the Broomfield River in south-eastern Cape York Peninsula. In Queensland, *S. olivaceus* flowers between June and August, but in New South Wales the flowering season is from October to December. The flowers last for over two weeks. In Queensland the plant form is more compact than the New South Wales form.

This plant is easy to grow in a cool glasshouse in 75% shade. I grow it on a log of paperbark or on a piece of hardwood. The only problem with paperbark is that it rots away after a period of time. Keep on the dry side until established.



From colour photo: G. Wells

FIG. 7: *Sarcochilus olivaceus*

Sarcochilus serrulatus D.L. Jones

This rare epiphyte is closely related to *S. olivaceus* and was known as *S. olivaceus var. borealis* until a few years ago. It is the same as *S. olivaceus* in plant growth but the flowers are dark green and blotched with brick-red or brick-red entirely.

S. serrulatus is not known in cultivation and is confined to the Atherton Tableland, north Queensland.

Sarcochilus tricalliatus (Rupp) Rupp

This epiphytic species was discovered in 1935 by K. MacPherson on Mt Dryander, north Queensland. It is closely related to *S. hillii* and until 1951 was known as *S. hillii var. tricalliatus.* Leaves are light green and unspotted, the same size as *S. hillii.* The flowers are white and fragrant, while *S. hillii* is not.

This orchid is distributed from the Fitzroy River to as far north as Princess Charlotte Bay, north Queensland. It grows in "dry scrub" on small trees and flowers between November and January. Culture is the same as for *S. hillii.*

Sarcochilus weinthalii F.M. Bail.

Also known as *Parasarcochilus weinthalii* (F.M. Bail.) Dockr., this rare epiphyte grows on rainforest trees. Resembles *S. falcatus* when not in flower. Leaves 90mm long, 12mm wide and of a yellow-green colour. Stems up to 50mm long. Roots white. Racemes, up to 80mm long, bear up to 12 cream flowers which are blotched with dull purple.

This orchid is distributed from the Richmond River in north-east New South Wales to south-east Queensland. The flowering season is August to October.

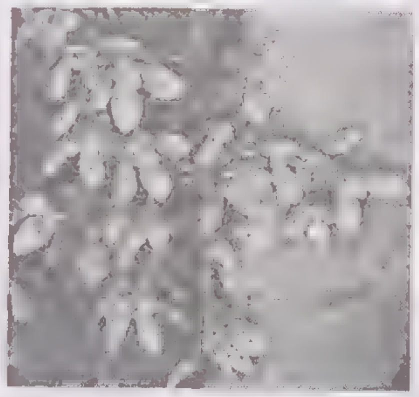


FIG. 8: Sarcochilus Weinhart (= *S. weinthalii X S. hartmannii*) From a black & white negative taken at the Hastings Valley Group Spring Show, 1980 (G. Wells)

WATERING AND FERTILIZING

This is probably the most important factor, for too much water will possibly rot the roots of the plant, and too little will make the plant shrivel up and die. For the lithophytic types, such as *S. hartmannii, S. fitzgeraldii, S. ceciliae* and their hybrids I water when dry, but with the epiphytic types they are kept on the dry side but are in a moist atmosphere. It depends on the growing medium, however. If the plants are grown in a mix that holds water the plant does not need to be watered often; but if the water flows straight through, the plant will need to be watered more often.

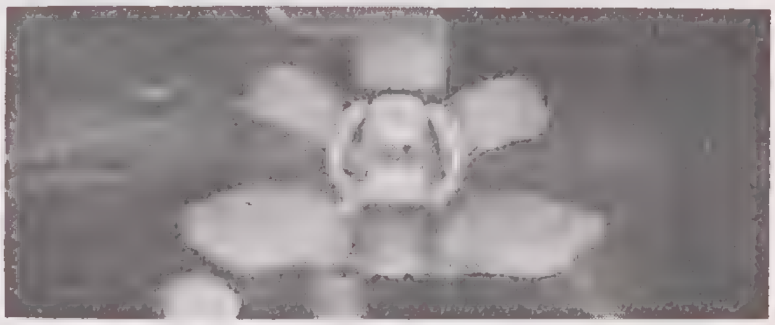
For fertilizing, I use Nitrosol every two weeks from August to April for the lithophytic types and hybrids containing these species. Every 4–6 weeks is the rule for the rest of the species. For the beginner, *S. hartmannii* and *S. fitzgeraldii* would be the easiest to grow.

HYBRIDS

Hybridizing with our native *Sarcochilus* has been going on for about twenty years, but only twelve crosses have been registered with the Royal Horticultural Society to date. Ten of these hybrids were made and registered by the late Ira Butler of Sydney.

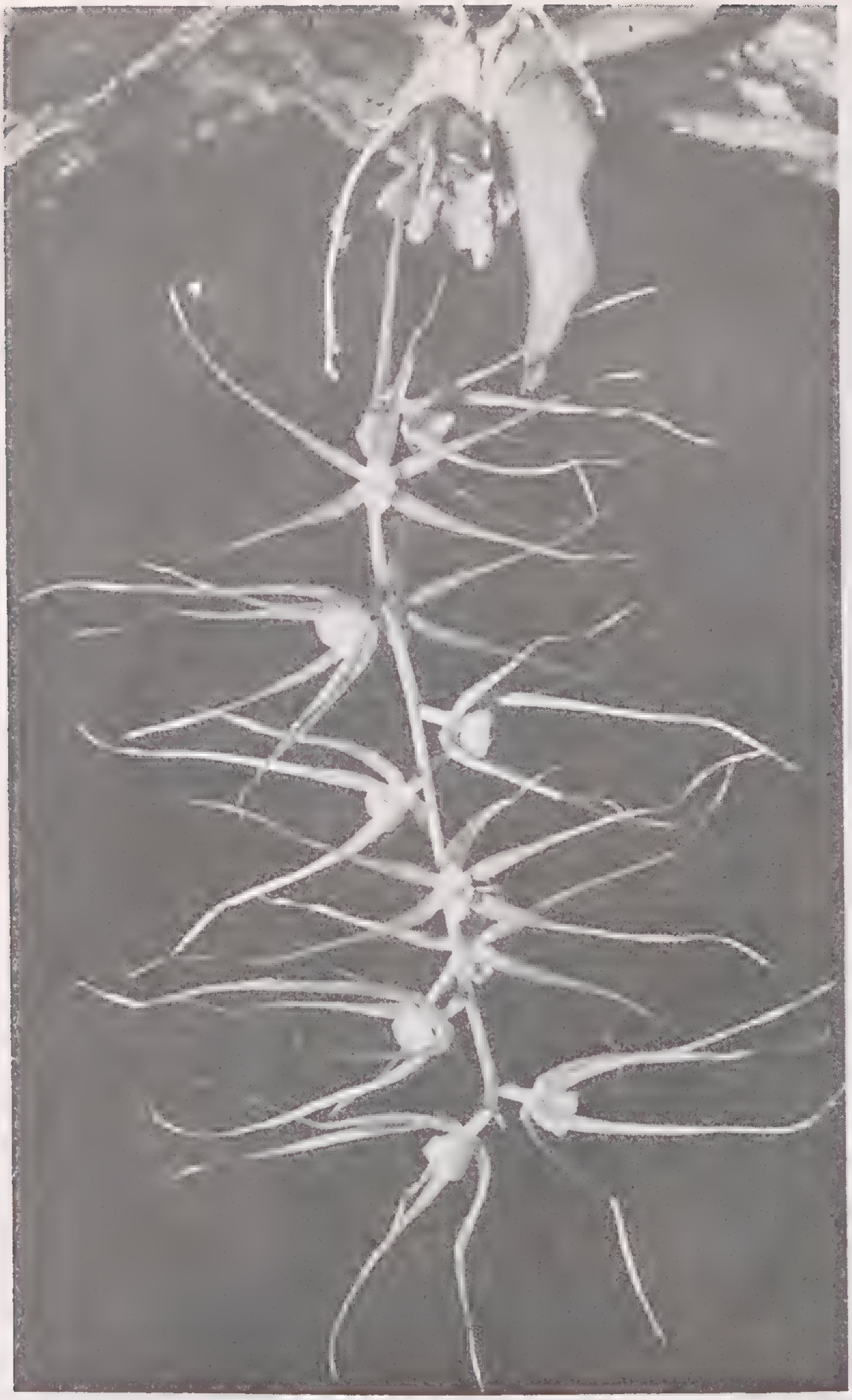
I have been hybridizing with the genus *Sarcochilus* for about four years. The first of my crosses, *S. fitzgeraldii x S. australis* flowered in the spring of 1978 and I have registered it as S. Shooting Star *. The plant produced 16 flowers on the raceme. The flowers were the shape of *S. australis* but with a purple centre. Plant form was like *S. fitzgeraldii* and very vigorous.

Hybrids registered to December, 1977 will be found in the ANOS publication "A Checklist of Australian Native Orchid Hybrids".



From colour photo: G. Wells

FIG. 9: *Pteroceras hirticalcar*



From colour photo: G. Wells
FIG. 10: *Rhinerrhiza divitiflora*

* * *

References:

The following books used in preparing this article may be recommended for further reading —

Bedford, 1969: *A Guide to Native Australian Orchids.*
Cady, 1970: *Australian Native Orchids* (in colour).
Clyne, 1972: *Australian Rock and Tree Orchids.*
Dockrill, 1969: *Australian Indigenous Orchids.*
Rupp, 1969: *The Orchids of New South Wales.*

183 Windsor Road
NORTHMEAD, N.S.W. 2152

*** Footnote:**
This cross appeared in the list of "New Orchid Hybrids" published in the *Orchid Review* for April, 1980. (January & February 1980 Registrations supplied by the R.H.S. as International Registration Authority.) This is the twelfth of the hybrids referred to above. There are, however, some intergeneric Australian native crosses made with Sarcochilus. From the ANOS "Checklist" of 1977 these are **Parachilus** (one made by Butler in 1972 and one by Jupp in 1976, using *Pteroceras*) **Plectochilus** (made by Rumrill in 1976 — two crosses with *Plectorrhiza tridentata*) and **Rhinochilus** (made by Butler in 1965 — two crosses with *Rhinerrhiza divitiflora.*)

— Editor

Another Occurrence of *Dendrobium pugioniforme* A. Cunn. x *Dendrobium tenuissimum* Rupp as a Natural Hybrid

by Noel J. Grundon

In his book *Australian Indigenous Orchids*, A.W. Dockrill stated that Mr L.W. Archer in 1962 found a natural hybrid between *Dendrobium pugioniforme* and *Dendrobium tenuissimum* in the Bellinger River district of north-eastern New South Wales. Mr R. Ford of Caloundra mentioned that he found a plant which is almost certainly another natural hybrid between these species (*The Orchadian*, Vol. 3 (7), page 88, 1970). Although Roy Ford did not state where he found his plant, it is possible that he found it in the mountainous area of the Blackall Range, just to the west of Caloundra.

On a recent collecting trip into the Goomburra district of the Great Dividing Range, east of Warwick in south-east Queensland, Mrs Joyce Leyden and Mrs Sheila Suley, members of the Darling Downs Group of ANOS, with permission from the Queensland Forestry Department, collected a plant which they believe is another natural hybrid between *D. pugioniforme* and *D. tenuissimum.* Mrs Leyden's plant has characteristics which appear intermediate between *D. pugioniforme* and *D. tenuissimum.* The overall vegetative appearance is that of a heavy specimen of *D. tenuissimum.* The roots and stems favour *D. tenuissimum* but the leaves are a mixture of characteristics of both parents. Some are thicker than those of *D. tenuissimum* but of the same shape, being about 70mm long, ribbed and pointed. Other leaves are quite smaller, looking like a thin, narrow *D. pugioniforme* leaf. The flowers which were produced in October-November resembled *D. tenuissimum* in shape, colouring and markings. The overall width of the flowers was about 30mm.

I do not know if Roy Ford's plants of the hybrid are still alive or if he has given them to another grower. However, it was good to read in a recent issue of *The Orchidophile*, the journal of the Sydney Group of ANOS that the original plant found by Len Archer is still flourishing in Sydney. I hope Joyce Leyden's plant continues to thrive. When it flowers next, I hope to make some detailed measurements of the plant and flowers. Perhaps somebody in Sydney could do the same with Mr Archer's plant and we could compare the characteristics of these two hybrids in some future issue of *The Orchadian.*

4 Jean Street,
TOOWOOMBA, Qld. 4350

Contributions to the Orchid Flora of the Araucaria Forests in New Guinea – 2

Neuwiedia veratrifolia Bl. and *Apostasia wallichii* R.Br. ex Wall.

by N.H.S. Howcroft

Recorded observations on the orchid flora occurring in the New Guinea *Araucaria* forests show that the members of the tribe *Apostasieae* are represented in one locality or another, and often occur in fairly large numbers in those localities.

The tribe *Apostasieae* is probably not well known by the amateur orchid botanist, and its genera are easily overlooked in the field, particularly when they are not in bloom, and because they look unlike most orchid forms. In flower, they are sometimes mistaken for a member of the lily family. The tribe, its genera and species, together with notes on habitat and distribution, are described below.

TRIBE – APOSTASIEAE

The tribe is closely related to the tribe *Cypripedieae* due to similarities in the structure of the androecium (the stamens taken collectively), as well as the modification of the same stamen in the genera of both tribes. In figures 1A and 1B, the structure of the flowers of the genera *Apostasia* (tribe *Apostasieae*) and *Paphiopedilum* (tribe *Cypripedieae*), can be compared with each other.

In order that the differences in floral structure, between members of other tribes, can be compared further, illustrations of the flowers and their floral parts have been included here for *Habenaria* (tribe *Orchideae*) in figure 1C, *Pterostylis* (tribe *Arethuseae*), *Spathoglottis* and *Calanthe* (tribe *Epidendreae*), in figures 2A to 2C.

The flowers of the *Apostasieae* are distinguished from those of the other tribes by the presence of a column bearing two or three distinctly stalked stamens or two stalked stamens and a staminode (figure 1A). The pollen is powdery. The ovary is triangular in cross-section, always 3-celled and with the outer surface distinctly ribbed.

In habit the plants are stiff, slender and erect, occasionally branching, bearing many plicate leaves. In one genus *(Apostasia)*, the apex of the leaves terminates in filiform tube-like tips. The inflorescence is terminal, mostly erect, sometimes curved and spreading, branched or unbranched, with small, yellow or white flowers.

The tribe contains two genera — *Neuwiedia* and *Apostasia*. Both genera are represented in New Guinea with a single species in each. *Apostasia* is represented in Australia by the same species.

KEY TO THE GENERA

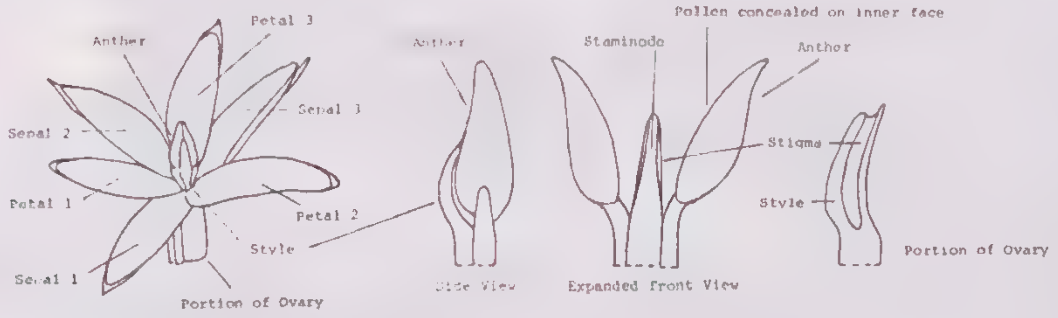
A. Inflorescence usually unbranched, erect; leaves usually wide; anthers 3, free from each other, filaments joined basally; ovary and fruit ellipsoid to roundish, apex strongly contracted . . . . *Neuwiedia*

B. Inflorescence mostly bowed and spreading, usually branched; leaves narrow; anthers 2, connate with one or both margins, filaments free from each other; ovary and fruit narrowly cylindric, apex not contracted . . . . *Apostasia*

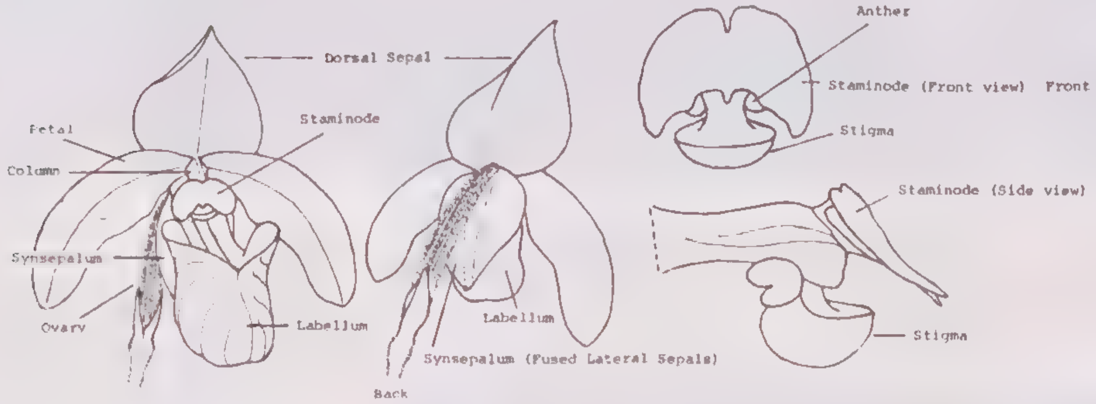
Figure 1

STRUCTURE OF FLOWERS

A APOSTASIA SP.



B PAPHIOPEDILUM SP.



C HABENARIA SP.

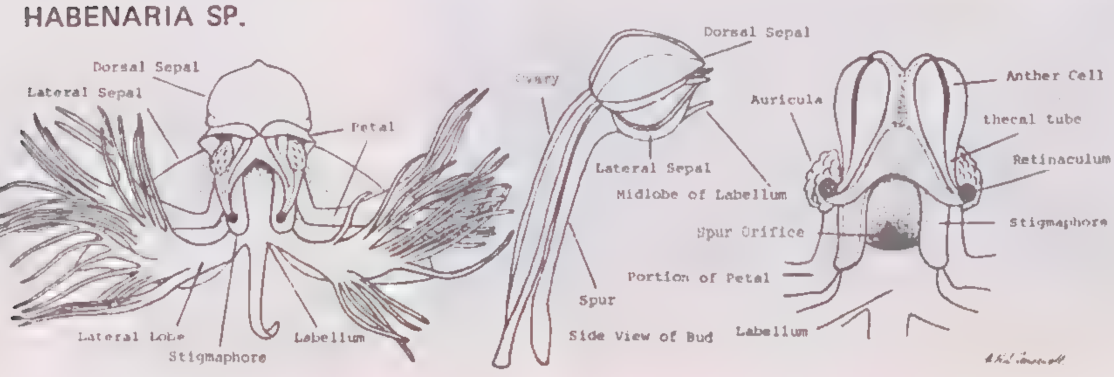
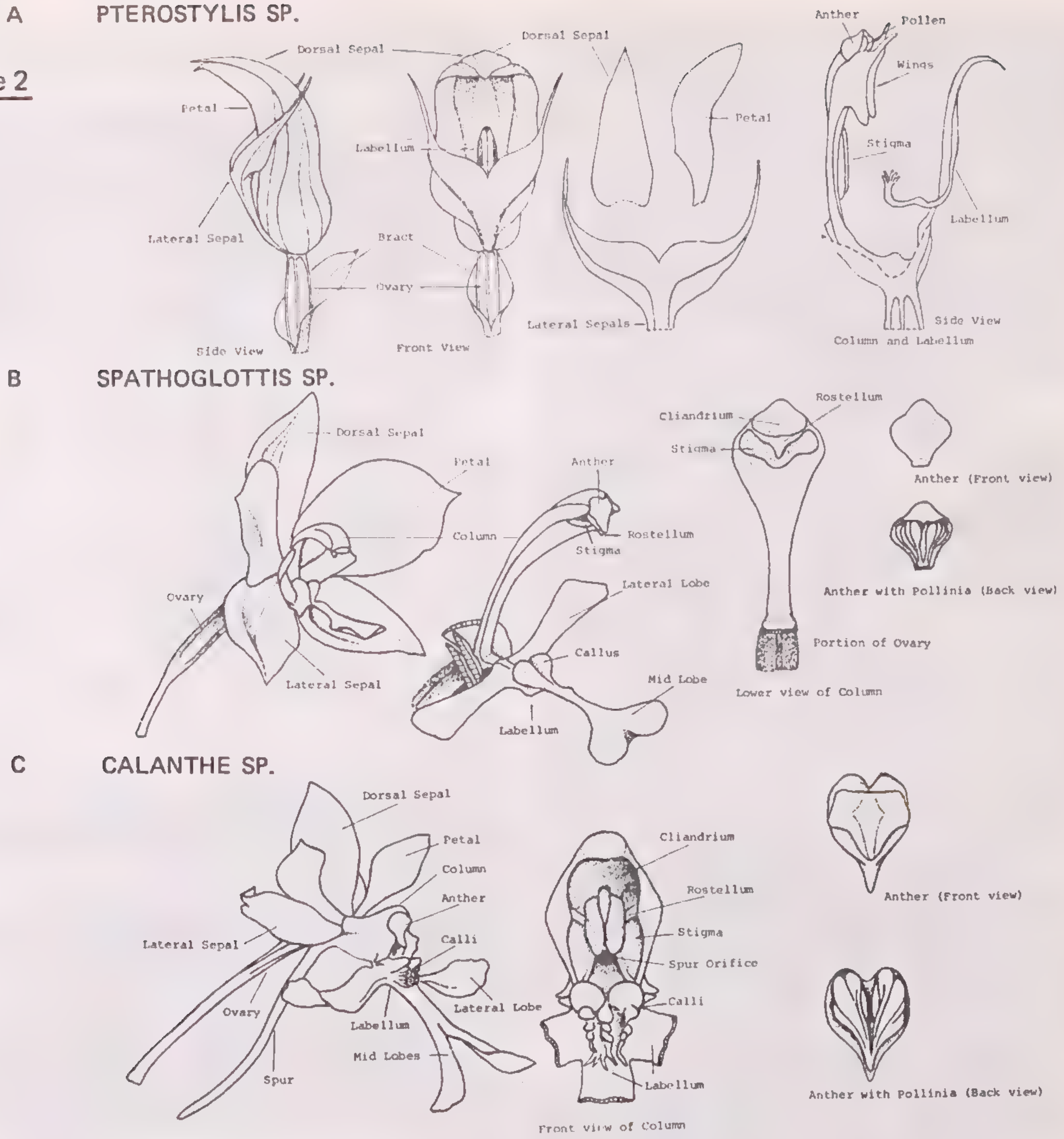


Figure 2



NEUWIEDIA Bl.

The genus extends from India, through Indonesia, Malaysia, the Philippines, to New Guinea and some adjacent islands. Of the nine species in the genus, only one, *Neuwiedia veratrifolia* Bl., occurs in New Guinea. The species is widespread in New Guinea and is found in Indonesia, Malaysia and the Philippines.

Neuwiedia veratrifolia Bl. (fig. 3)

Tydschr: Nat. Gesch. 1 (1833) 142

Terrestrial, erect, up to 120cm tall; *leaves* up to 78cm, linear lanceolate, acuminate, petiolate, nerves up to 7, base of leaves sheathing stem; *inflorescence* up to 52cm long, terminal, with hairs and short narrow bracts, bearing 48 to 80 flowers close together; *flowers* yellow, fragrant, sepals and petals up to 2cm long, 0.7cm wide, with hairs, keeled, cusped, nerves 7; *fruit* a thin walled capsule, ribbed, more or less triangular in cross section and 3-valved.

DISTRIBUTION (Map No. 1): The species is widely distributed in New Guinea from sea level to 750m altitude. Collection localities are indicated by dots on map No. 1, and crosses indicate sightings but no collections made. The arrows indicate *Araucaria* localities where the species

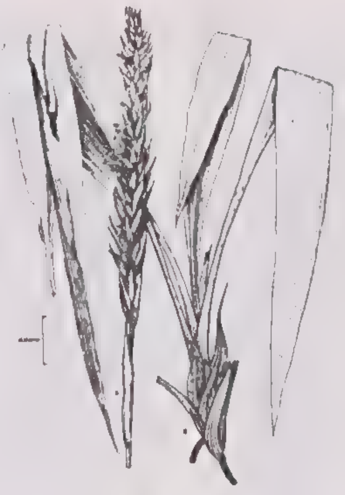


Figure 3

Neuwiedia veratrifolia Bl. Illustration of pressed specimen. A inflorescence, B plant habit.

Drawing: N.H.S. Howcroft

has been found. From right to left, on the map, the localities are identified as follows: — (F) Fergusson island, in *Araucaria cunninghamii* forest, (G) Garaina, in *Araucaria hunsteinii* forest on Mt Pangawi, at the junction of the Ono and Daria rivers, (B) Bulolo, in *Araucaria cunninghamii* forest and (P) Pimaga in the same type of forest. Further localities will eventually be added.

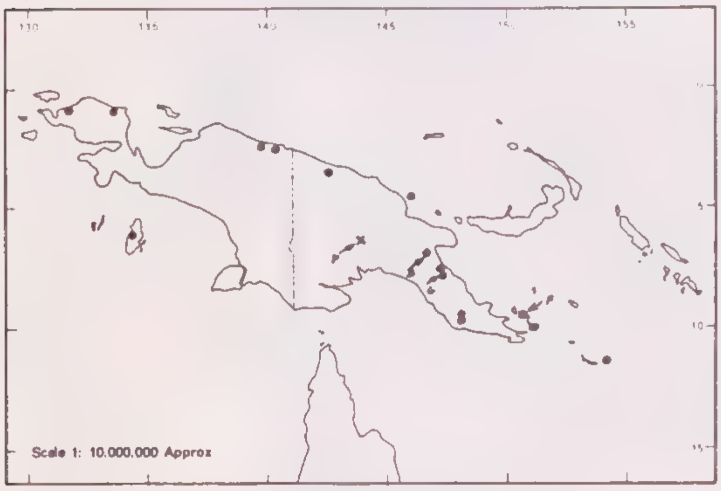
HABITAT: This orchid is usually found growing on rather wet sites, either in root peat and leaf litter over clay, or in clayey soils. The sites on which *N. veratrifolia* grows, are usually moderate to heavily shaded. The rainfall, for the areas where this orchid occurs, is usually high and around 3,000mm; it is possible that the species also occurs in areas with 2,000mm annual rainfall.

FLOWERING: Plants have been recorded flowering from April to June on the coast, and in June and July at Pimaga, in the southern highlands, at an altitude of 750 metres. A number of plants bearing green fruits, and in one case unopen buds, were found on Mt Morima, Fergusson island, in October.

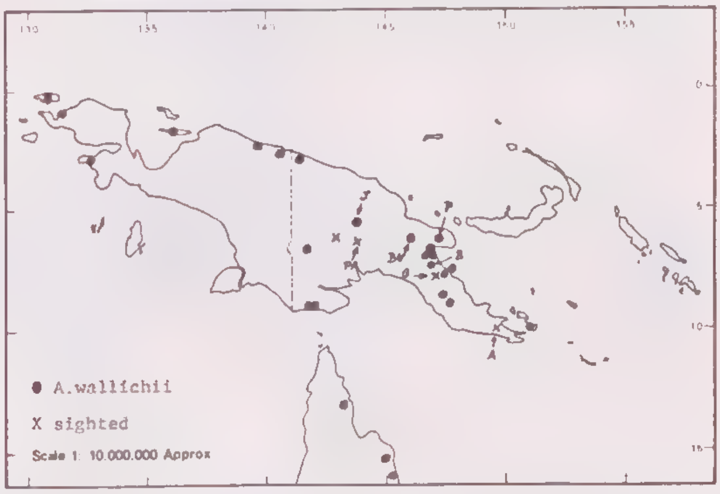
CULTIVATION: A number of people have attempted to grow *N. veratrifolia* in pots, containing soil from localities where the specimens were collected. All attempts were unsuccessful. It seems that this orchid is very difficult to cultivate, as no-one has been able to keep specimens alive for very long in captivity in Papua New Guinea.

NOTES ON ILLUSTRATION: The Author's illustration is of a pressed specimen, and unfortunately, it only shows the inflorescence with closed dried flowers (fig. 3A) and the plant habit (fig. 3B). It is hoped, that eventually preserved flowers will be collected, to complete this illustration for a training manual.

MAP 1
Distribution of Neuwiedia Veratrifolia Bl. (Partly after De Vogel)



MAP 2
Distribution of *Apostasia wallichii* R. Brown ex Wall. (Partly after De Vogel)



APOSTASIA Bl.

This genus occurs in South and South-east Asia, throughout Malaysia to north Queensland.

There are seven species in the genus. The New Guinea species is *Apostasia wallichii* R.Br. ex Wall. It is widespread, ranging from Australia, where it was formerly known as *Apostasia stylidioides* and throughout New Guinea to Nepal, west to Sri Lanka and east to the Philippines.

Apostasia wallichii R.Br. ex Wall. (fig. 4)
Plant. Asiat. Rav. 1 (1830) 75, t. 84

Terrestrial, erect, up to 100cm tall; *stem* slender, sometimes branched; *leaves* closely set, linear, acute, apically filiform, up to 50cm long and 1.8cm wide, nerves 3 to 5, leaf base slightly sheathing; *inflorescence* terminal, erect to bowed, spreading, with up to 6 side branches bearing up to 30 flowers; *flowers* usually yellow, sometimes white, sepals and petals 0.5cm long, 0.17cm wide, cusped, nerves 3 to 5; *fruit* a slender capsule.

DISTRIBUTION (Map No. 2): Widespread in New Guinea from sea level to 1,500m altitude. Also occurring in north Queensland, Australia. The species is found in the forests of both species of *Araucaria* in Papua New Guinea, and it is often quite common in parts of Oak *(Castanopsis)* forests.

The locations, where *Apostasia* plants have been sighted or collected, are indicated by arrows with letters on map No. 2. They are as follows, commencing from 10° latitude: — (A) Agaun, (B) Bulolo, (G) Garaina, (P) Pindiu, (BU) Bumbu, (PA) Pimaga, (J) Jimi Valley.

The maps localities should not be treated as being complete, as further additions are expected.

HABITAT: *Apostasia wallichii* grows in clay loams, either with a thin or thick overburden of root peat and leaf litter. In a number of localities, the soils are subject to periodic moisture stress. Overhead shade is nearly always dense, sometimes the surrounds are exposed to mild side light. Specimens that are exposed to direct light react by turning a yellow green colour. These plants quite often perish.

Over the known distribution range of the species, in Papua New Guinea, the annual rainfall is from 1,600mm to ± 3,000mm.

FLOWERING: Flower buds appear around July, and open about August. It may be possible that flowering occurs twice a year and further observations are required.

CULTIVATION: Plants can be successfully grown in clay or clay loams, with a top cover of peat or mulch. Shade and constant moisture are necessary for plants in captivity. Other than for scientific studies, there seems no point in bringing this plant into culture, as it has no real horticultural value, and the native populations are best left undisturbed.

NOTES ON ILLUSTRATION: The Author's illustration No. 73 N.H. is of a live specimen collected at Nawati Banda, Bulolo, in *Castanopsis* forest. The flower has portion of its ovary removed and was spirit material made from the Nawati Banda specimen. This orchid is well illustrated in Dockrill's *Australian Indigenous Orchids.*

Acknowledgements

I wish to thank Mr M. Galore of Botany Division, Lae, for the reproduction of my illustrations.

General References:

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De Vogel, E.F. (1969): Monograph of the tribe Apostasieae (Orchidaceae). Blumea 17 : 313 — 350.
Henderson, M.R. (1954): Malayan Wild Flowers. Monocotyledons, pages 11 — 13.
Holttum, R.E. (1953): Orchids of Malaya. (A revised Flora of Malaya Vol. 1964) pages 63 — 66.

BULOLO,
October, 1980 PAPUA NEW GUINEA

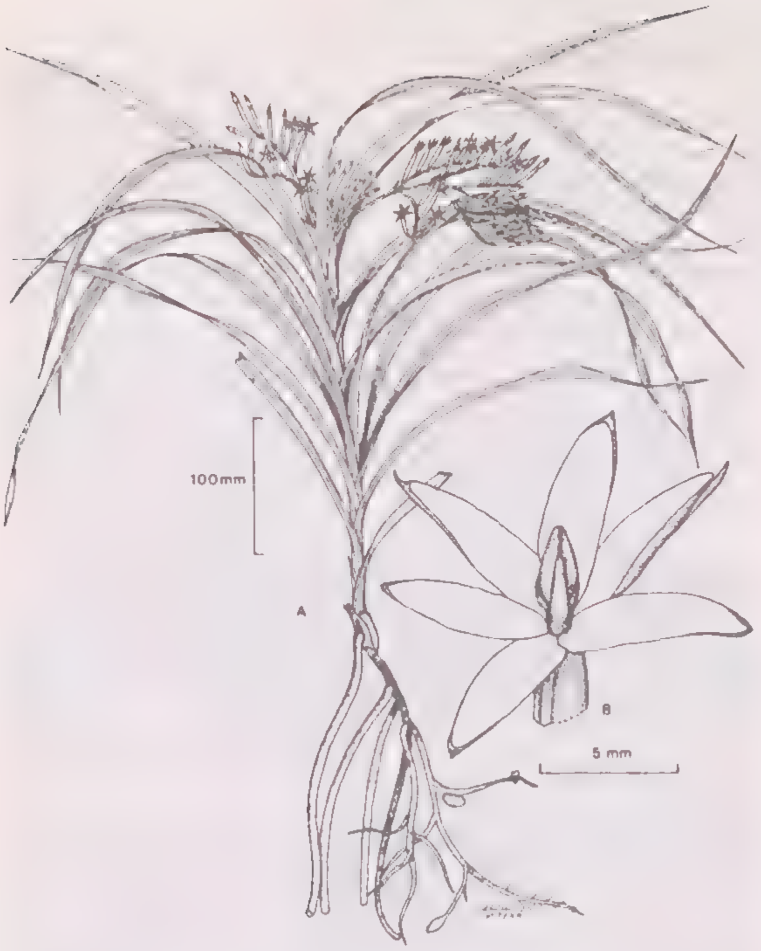

Figure 4

Apostasia wallichii R. Brown ex. Wall. A. plant habit — live flowering material, B. flower with portion of ovary missing — spirit material. Drawing: N.H.S. Howcroft

SPRING SHOWS, 1980

The Combined Sydney and Warringah Groups

1. A Word from the Show Marshall —

One of the most pleasing aspects of this show was the increase in entries; 216 individual entries and 3 excellent displays presented by Chris Arnott, Phil Spence and Jim Walker.

The plant that captured everyone's attention was Eric Webeck's *D. X delicatum* which was awarded Champion Nature Hybrid Orchid and Champion Specimen Native Hybrid Orchid.

One thing that fascinated visitors was the use of snail shells in the pots of terrestrials exhibited by David McAlpine who assures us that crushed snails are excellent as fertilizer. None who have seen his plants could doubt that statement.

Obviously the show was a great success in every aspect, but one point I would like to make is that it is open to members of ALL orchid societies; so don't forget 1981 !

NORMAN HILLIGER
Show Marshall

2. AND a word or two from the Editor —

Apart from the two championship prizes for Eric Webeck's *D. X delicatum* (see figure 1) there were two other championships: (a) the Champion Native Species Orchid — for Mike Harrison's *Robiquetia wassellii,* and (b) the W.H. Murdoch Prize for Champion Specimen Native Species Orchid — for Bob Lowe's *Dendrobium gracilicaule.* The organisers of this show are to be congratulated on their decision of a year ago to increase the number of competitive sections. This proved eminently successful in bringing under notice some of the excellent but less spectacular exhibits and allowing the judges to extend their indulgence to certain of the rarer species which could not otherwise have come to the fore.

Wal Upton's *Dendrobium ophioglossum* in Best New Guinea Species section was of special timely interest to your Editor who had his September issue of *The Orchadian* on display at the Show containing an article on this species by Dr P.S. Lavarack. Its true identity is "now usually considered to be *D. purpureum* Roxb."

Also of interest to hybridists was the success of Phil Collin's latest remake of *D. X gracillimum.* One seedling of this cross won Best *D. X gracillimum* (Section 13), while another sibling gained second prize in Section 15, Best Hybrid Seedling — First Flowering.

— EDITOR

The Second Annual Spring Show of ANOS Hastings Valley Group, held at Wauchope on Saturday, 11 October, was, as one would expect from an area which must rate as one of the best orchid growing regions in Australia, a showpiece of both quality orchids and the growing skills of the locals. The unusually warm, dry winter did take its toll, and many of the early flowering species were well and truly finished, but the later flowering types more than compensated for their absence.

As was the case last year, a wonderful display of *Dendrobium kingianum* was the focal point of the show, and it was easy to see why growers of natives travel to Wauchope specifically to see this orchid, both in cultivation and in the wild. Alwyn Flanagan, who was most successful exhibitor of the show, and whose home we visited during our stay, must certainly have one of the finest collections of *D. kingianum* in the land, and even many of the plants he decided not to exhibit were potential prize winners.

Champion Orchid of the Show was awarded to Mavis and Jeff Howe's *Cymbidium canaliculatum,* and I feel sure that visitors to the show would have agreed with the judges' decision. It was the type form of the species, with brown blotching and a yellow base and had large, well opened flowers; a truly beautiful specimen. The Sarcanthinae classes were also well represented, with some beautiful plants of both *Sarcochilus hartmannii* and *S. fitzgeraldii* on the show bench, as well as some of the more diminutive species such as *Pteroceras spathulatus, Sarcochilus hillii, Rhinerrhiza divitiflora* and *Schistotylus purpuratus.* The hybrid Sarcochilus Weinhart *(S. hartmannii X S. weinthallii)* was also a popular benching, and several plants of this crossing were present (see fig. 8 on p. 232).

All things considered, it was a fine show, and congratulations must go to President Robyn Cook and her committee for all the work they put in. I, for one, am looking forward to visiting Wauchope in 1981 for their Third Annual Spring Show.

MIKE HARRISON

FIG. 1: Eric Webeck's *D. X delicatum,* Champion Native Hybrid (Silver Medal) and Champion Specimen Native Hybrid (Silver Medal).
From colour photo: P. Collin

FIG. 2: *Cymbidium canaliculatum* Champion of the Hastings Valley Group's Spring Show at Wauchope. (Close-up of a flower.)
From colour photo: G. Wells

VISIT TO AUSTRALASIA 16 AUGUST – 21 SEPTEMBER, 1980
A preliminary Report to the Australian Orchid Foundation

by P.J. Cribb

1.) **Purpose of Visit:** Following the 9th World Orchid Conference in Bangkok in 1978, the International Orchid Commission sent a request to the Royal Botanic Gardens at Kew for two sections of *Dendrobium* (Orchidaceae) to be urgently revised. The species of these sections (*Latouria* and *Ceratobium*) are predominently found in New Guinea and adjacent areas and have been used extensively in recent years in hybridisation programmes to produce showier, longer lasting and more floriferous orchids particularly for the cut-flower trade. However, their nomenclature is so confused that the registration of many of the new hybrids has been impossible and thus large numbers of desirable hybrids are at present without registered grex names. This particularly worried the Royal Horticultural Society registrar(Mr J. Greatwood) who has emphasised the importance of stabilising the nomenclature of these orchids.

The I.O.C. request was favourably received by Kew and permission was granted some eighteen months ago by the Director for the author (Dr P.J. Cribb) to revise these sections. Each section contains about 40 — 60 species (but many more names) and by this summer a provisional key to section *Latouria* had been produced and privately distributed for testing on living material. The work on *Ceratobium* is less advanced but a tentative key to that section was also produced for testing on this visit.

As a result of the studies made on living material during this recent visit, the results of the herbarium studies made by me at Kew, Harvard, the British Museum, Sydney, Melbourne, Lae and elsewhere have been tested and often clarified or amended. As a first step to the production of a revision of each section I have arranged with the editor of the orchid journal *The Orchadian* to send him for publication copies of the provisional keys to each section as well as other ancillary articles. Hopefully, this will generate a response from orchid growers who test the keys so that final versions will be ready for the publication of the revisions in the Kew Bulletin. A popular account of each section is also desirable and I now have enough colour photographs and line drawings to contemplate eventually producing a handbook to the sections. A similar approach to the ornamental *Dendrobium* sect. *Oxyglossum* is also being followed by T. Reeve and P. Woods. Thus three sections of this taxonomically complex and poorly understood genus will have been revised in the not too distant future.

2.) **Itinerary:**

August	16–17	London–Sydney
	18–19	Sydney Royal Botanic Gardens
	20	Melbourne Royal Botanic Gardens
	21	Sydney–Vila (Efate)
	22–23	Efate
	24–27	Guadalcanal
	28–31	Bougainville
September	1	Bougainville
	2	New Britain
	3– 4	Lae (Papua New Guinea)
	5– 8	Wau and Bulolo (Morobe District)
	9	Mt Hagen
	10–13	Laiagam (W. Highlands District)
	14–15	Port Moresby (Central District)
	16	Cairns (Queensland)
	17–19	Sydney
	20	to London

3.) **Report:**

a) **Australia 18–21** August

Visits were made to the herbaria of the Royal Botanic Gardens at both Sydney and Melbourne to study critical type specimens especially those of White, Bailey and Mueller. Dr P.S. Lavarack had also kindly sent critical material of *Ceratobium* and *Latouria* from the Brisbane Herbarium which I was able to study.

b) **Vanuatu**

The species of *Ceratobium* and *Latouria* from the Pacific Islands pose many problems. Many have been introduced since the war into living collections and are often known by "nicknames" because many are apparently undescribed or the application of names is confused. Thanks to the kind hospitality of Mr G. Hermon Slade, I was able to visit two orchid collections to see flowering material of species from Efate and adjacent islands. He also organised a visit to nearby Mt Austin where again I saw species in flower. Pickled specimens of these were made for the Kew Herbarium and a photographic record was also made (this procedure was followed for the whole five week visit).

c) **Solomon Islands**

Our visit to the Solomon Islands centred on Guadalcanal and we were greatly assisted there by Mr G. Dennis of Honiara. Again orchid collections were visited in Honiara and critical species from adjacent islands such as Malaita were seen in full flower. Mr Dennis and a friend had just returned from an expedition to the central mountain chain of Guadalcanal and I was able to obtain specimens of high altitude *Latouria* species which otherwise I would not have seen.

Accompanied by Mr Dennis we also visited two areas on the island, the first directly behind Honiara and the second on the way to Gold Ridge. Collections were made in both areas of living plants and herbarium specimens. Of particular interest on Guadalcanal were the various forms of *Dendrobium gouldii, D. pseudotokai* and *D. kajewskii* and the various forms of *D. macrophyllum.*

d) **Bougainville**

Mr John Pedersen, the Manager of the Aropa Plantation, met us on our arrival and accompanied us throughout our four day visit to the island. His local knowledge and help was invaluable. We made several excursions in the area between Kieta, Arawa and Panguna. On one day the Managing Director of Bougainville Copper kindly allowed us to use a helicopter to reach the Kupei pass area.

The Panguna Pass (1100m) proved to be particularly interesting for there the spectacular *Dendrobium rhodostictum* grows in abundance with the closely related *D. ruginosum.* Careful observation indicated that hybridisation is not infrequent and solved a perplexing taxonomic problem.

The identity of the widely cultivated D. "Bougainville White" was also partially solved. It is undoubtedly the same as *D. imthurnii* which may itself be a form of *D. gouldii.*

e) **New Britain**

On a brief morning stop-over at Rabaul we were able to visit two large collections of *Ceratobium* species and hybrids. These collections owned by Jack Dunbar-Reid and Don Clarke are outstanding and contain an array of rare species notably of *D. helix* and *D. tangerinum* both of which I have recently described.

Study of upwards of 15 colour forms of *D. helix* showed beyond doubt D. 'Talasea' to be a colour variant of that species and not an undescribed one.

f) **Lae** (Papua New Guinea)

I spent a day and a half in the Herbarium at Lae working on *Dendrobium* specimens. I was able to name over 200 sheets and have borrowed a further fifty sheets of critical species.

g) **Wau and Bulolo**

From Lae we drove to Bulolo and met Neville Howcroft. He has a large orchid collection and a considerable collection of preserved material which I was able to study. With his help we made two excursions to nearby logging areas and were able to collect several *Latouria* species which we had previously not seen, including *D. otaguroanum* (syn. *D. chloroleucum*) and *D. engae.*

h) **Laiagam**

From Wau we returned to Lae and then flew to

Mt Hagen. There we hired a car and drove on a good road the 3½ hours to Laiagam in the W. Highlands. The next few days were spent with Tom Reeve who has established himself as a leading authority on PNG orchids. He has established an orchid nursery at Laiagam under the auspices of the Dept. of Primary Industry (Enga Province). This collection consists of highland orchids (from above 5000′) and is in excellent condition. He has collected orchids over a vast area of the Highlands and was able to give me specimens of many of the New Guinea *Latouria* species including four undescribed ones and the recently rediscovered *D. cruttwellii* and *D. simplex.* He also let me have specimens of two new highland *Ceratobium* species (up to 2000m) which, if used in breeding programmes, would extend the temperature tolerance of hybrids.

We made several excursions up to 3000m to nearby areas with him and were able to see many of the Latouria species growing in their natural habitats.

i) **Port Moresby**

Frank Ginate, the Curator of the Natural Capital Botanic Gardens, showed us their orchid collection which contains a magnificent selection of *Ceratobium* species including the spectacular *D. lasianthera* (syn. *D. ostrinoglossum*), *D. veratrifolium* (syn. *D. lineale*), *D. antennatum* (syn. *D. d'albertisii*) and many others.

j) **Cairns and Atherton**

The Rev. Ron Collins met us at Cairns airport and took us to see his and Jeff Stocker's orchid collections at Atherton. The former gave me specimens of *D. bairdianum,* one of only two Australian *Latouria* species, whilst the latter was able to show us *D. forbesii* and *D. polysema* in full flower.

k) **Sydney**

On my return to Sydney I was able to reassess some of the herbarium specimens I had previously looked at. I also had the opportunity of visiting the living collections of Phil Spence, Wally Upton and Joe Betts all of whom had interesting species in flower. In particular, Phil Spence had *D. pulchrum* in flower and I am now convinced it is merely a small-flowered form of *D. polysema.* Joe Betts had the Australian *D. wilkianum* in flower. This is undoubtedly identical with the widespread New Guinea species *D. mirbelianum.*

4.) Results:

I have now amended my provisional keys to both sections in the light of my observations on this visit. Four new species of *Latouria* and two new *Ceratobium* species are shortly to be described by Tom Reeve and myself. Of these, one of the Latourias is very showy and will undoubtedly be a valuable parent. Similarly, the two *Ceratobium* species and the recently described *D. crispilinguum* will be valuable parents, hopefully extending the temperature range of this group. *D. crispilinguum* has already been shown by N. Howcroft to produce hybrids with erect inflorescences in which the flowers stand out rather than droop (a characteristic of many hybrids). *Latouria* species crossed with *Ceratobium* species would also increase the cold tolerance of the latter. Better shaped fragrant flowers might also be introduced into the hybrids if the newly described *D. engae* is used.

5.) Conclusions:

The generosity of the Australian Orchid Foundation has enabled me to improve greatly my understanding of the taxonomy of the two sections of *Dendrobium.* It has also enabled me to make large living and spirit collections for Kew. Hopefully, this visit will have speeded up completion of this project by several months.

6.) Published articles by the author on Dendrobium:

a) "Three New Species of *Dendrobium* sect. *Ceratobium* from Papua New Guinea" in *Orchid Review* and *Orchadian* 6 (8): 174-178 (1980).
b) *"Dendrobium polysema"* Curtis's Botanical Magazine (1980).
c) *"Dendrobium johannis* and *D. semifuscum* in north Queensland" *Orchadian* 6 (9): 209-211 (1980).
d) "A proposal for the retypification of Dendrobium Sw. nom. cons." in Taxon 28 (4): 409 (1979).

Acknowledgements:

I would like to thank Dr A. Morrison, my companion for most of this trip for his considerable help in making it possible; Mr G. Hermon Slade of Vila, Vanuatu, without whose assistance the visit would have been impossible; Geoff Dennis of Honiara, John Pedersen of Aropa, Jim Croft of Lae, Neville Howcroft of Bulolo, Chris and Paquita Boston of Wau, Tom Reeve of Laiagam, Frank Ginate of Port Moresby, Ron Collins of Atherton and last, but not least, Don Blaxell of Sydney for their hospitality and help during the past five weeks.

26 September, 1980

Royal Botanic Gardens
KEW, ENGLAND

Caladenia caerulea R.Br. and *Paracaleana nigrita* (Lindl.) Blaxell

Two species previously listed as being South Australian but probably not occurring in that State.

by R. Bates

Dr R.S. Rogers in *Flora of South Australia* Part 1 by J.M. Black, 2nd Ed. (1943) lists *Caladenia caerulea* R.Br. as occurring in South Australia at Bugle Ranges. As his herbarium did not contain any South Australian material and no other collections or sightings are known for this State, it must be doubted that the species occurs here. The Bugle Range area is largely devoid of native vegetation, but collectors in that area in the last fifty years have found no evidence of the species. Certainly it is surprising that *C. caerulea* does not occur in South Australia as it is common in western Victoria and extends into the south -eastern province of Western Australia.

Blaxell in a review of Arthrochilus and related genera (1972) includes South Australia in the distribution of *Paracaleana nigrita* (Lindl.) Blaxell.

The single South Australian (?) collection in the Adelaide herbarium was supposedly made by a collector in the Mt Compass area of South Australia; but it was given to the herbarium the year after a visit by that collector to Western Australia. Checking revealed the collection from South Australia to be not genuine. It is unlikely that *P. nigrita* would occur in the Mount Compass area since it is so dissimilar to the habitats of *P. nigrita* in Western Australia.

Portmarnock Street
FAIRVIEW PARK, S.A. 5126

Dendrobium kauldorumi (See article page 224).
From colour slide: T.M. Reeve

NATIVE DENDROBIUM HYBRIDISING

by David M. Cannon

When asked to write on my hybridising work I wondered how to start; so I have gone back to the beginning. I first began hybridising in 1969. At this stage very little information was available in regard to breeding of native orchids. Unfortunately the laboratory to which I sent my pods in 1969/70 gave me no results.

In 1971 I changed to another laboratory and had mixed results. By now I was wondering if it was going to be worth the effort for the poor results I was getting. After talking to other hybridisers at this time, additional information in regard to green pod culture was obtained. As the 1972 flowering season approached I decided to begin planning what parents I would use and not just use any two flowers that were out. Pod results were good and germination had mixed results. Some pods gave high germination, whereas others only gave 10—15 plants.

During the years 1973—1977 ill health caused a lapse in my breeding programme, but I continued to buy plants that I required for future breeding.

As the flowering season of 1978 approached I was ready to begin again. Many plants had flowered over the previous four years and select plants had been marked as parents. I decided to concentrate on two main areas. All plants chosen for breeding had to show vigorous growth and prolific flowering characteristics. The two aims of breeding were multiplicity of flowering times and albino flowering.

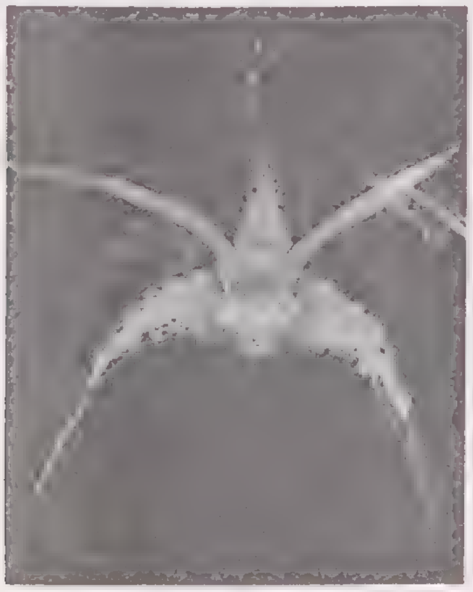

FIG. 1: Dendrobium Blushing Star
(= D. tetragonum var. giganteum x X suffusum)

With multiplicity of flowering two species have this characteristic and it is carried through to their hybrids. *Dendrobium tetragonum var. giganteum* would be the best known of these. *D. tetragonum var. giganteum* has a star shaped flower up to and sometimes in excess of 70mm overall height and can flower twice a year. D. Blushing Star (using *D. tetragonum var. giganteum* with X *suffusum*) was the first of these crosses to flower. (See fig. 1) The shape is similar to D. Ellen, but the flowers are heavily spotted and sometimes heavy marginal colouring on the edges of the petals and sepals. Unflowered hybrids of *D. tetragonum var. giganteum* that hold a lot of promise are x D. Hastings, x D. Ella V. Leaney and x D. Sunglow.

The next step is where *D. tetragonum var. giganteum* first generation hybrids are being used as parents. These hybrids will increase the range of flowering times and the colours of these hybrids will range through all shades of yellow to apricot and in some cases, sunset colours with mixtures of reds and yellows blending. The first hybrids having both parents first generation *D. tetragonum var. giganteum* hybrids have now been made. D. Blushing Star x D. Hilda Poxon 'Tigress' (fig. 2) are yet to flower but having dual *D. tetragonum var. giganteum* in its breeding it should be extremely prolific in its flowering characteristics and a wide range of colours should appear. The growth of the seedlings has been very vigorous.

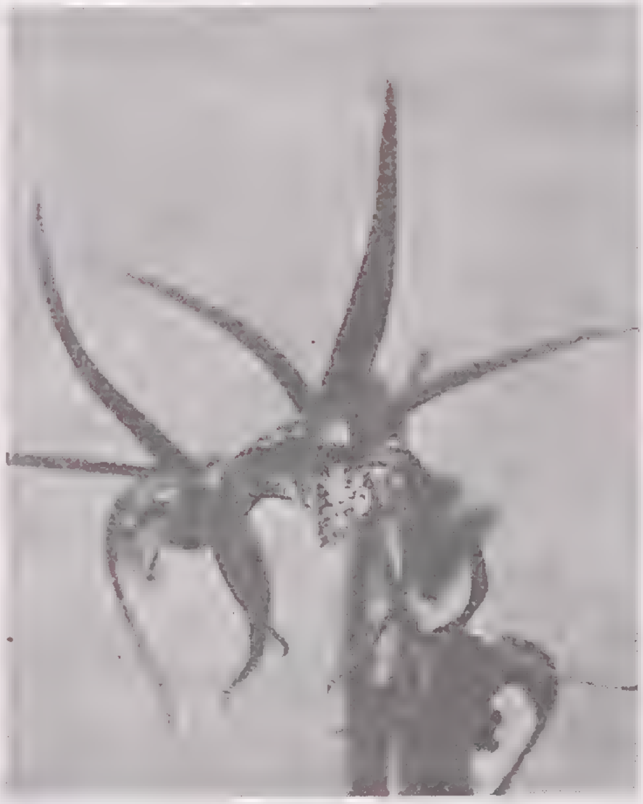

FIG. 2: Dendrobium Hilda Poxon 'Tigress'
(= D. tetragonum var. giganteum x speciosum)

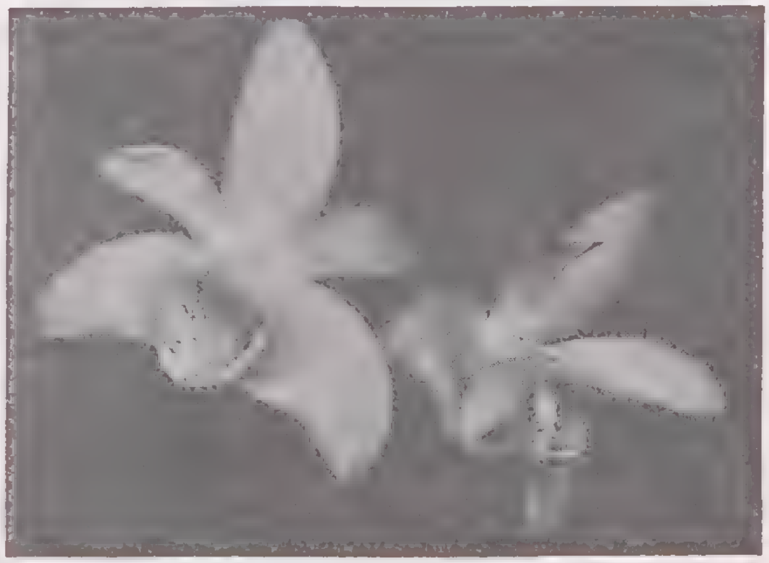

FIG. 3: Dendrobium Peach Glow
(= D. Hastings x D. Golden Fleck)

The other species that imparts its multiplicity of flowering times is *D. fleckeri,* which has a beautiful golden apricot flower. The first *D. fleckeri* hybrid, D. Hastings, resulted from a crossing with *D. kingianum.* D. Hastings will flower regularly autumn/winter and spring/summer and as a parent it is imparting this flowering characteristic to its hybrids. The first hybrids of D. Hastings have flowered and they are exceptional.

D. Peach Glow (see fig. 3), a hybrid of D. Hastings x D. Golden Fleck *(D. fleckeri x D. gracilicaule)* is as the name implies, a lovely soft peach colour with a frilled labellum coming from the dual *D. fleckeri* in its breeding. D. Eureka *(D. fleckeri x D. ruppianum)* (see fig. 4) seedlings are flowering gold to deep apricot and carry the predominant frilled labellum from *D. fleckeri.* D. Eureka has now been crossed with *D. speciosum* and this should produce long sprays of golden apricot flowers possibly twice a year.

(Figures 1 — 10 reproduced from colour prints supplied by the author.)

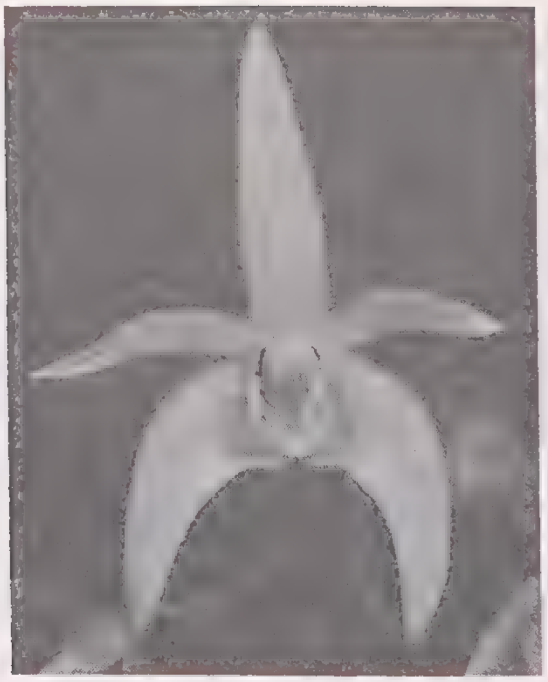

FIG. 4: Dendrobium Eureka
(= D. fleckeri x D. ruppianum)

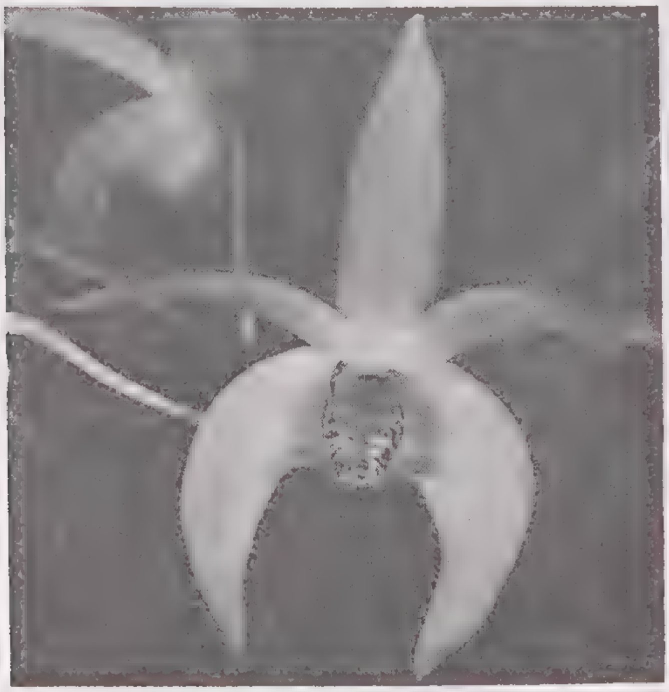

FIG. 5: Dendrobium Sunglow
(= D. fleckeri x D. speciosum)

D. Sunglow *(D. fleckeri x D. speciosum)* is the cream of the *D. fleckeri* hybrids to date (see fig. 5). Very few seedlings were raised but the flowering has made it well worthwhile. D. Sunglow is flowering up to three times a year and has deep gold to apricot flowers with heavy red markings on the labellum and up to nine flowers per spike on early flowering.

ALBINO BREEDING:

Albino breeding in Australian native orchid hybridising is still in its embryo stage.

Albino 'Alba' is a term I use to designate a particular white flowering form that has no apparent recessive red genes. The aim of this line of development breeding is to be able to plan and produce pure white hybrids. Very few Albino 'Alba' flowering plants have resulted from hybridising to date. Three plants that are being used in this line of breeding are *D. X delicatum* 'White/Lilac', a large white with a deep lilac labellum, D. Gillian Leaney 'Frost White' and D. Ellen 'Snow White' (fig. 6). One natural Albino 'Alba' clone that has been used is *D. kingianum var. silcockii* (fig. 7), a compact growing white with a deep lilac labellum. *D. kingianum var. silcockii* was crossed with D. Susan (yellow) to give us D. Kit Murdoch (fig. 8). All plants flowered to date are glistening whites on compact plants.

D. Delicate Falcon (X *delicatum* 'White/Lilac' x *falcorostrum*) was the first to flower (fig. 9). All plants flowered to date are beautiful whites with a lightly lilac spotted labellum. The spikes are semi-arching to pendulous and carry up to 15 flowers per spike. A bonus with this cross is that the perfume of *D. falcorostrum* is carried through. This flowering season, September, we have flowered the first plants of D. Sun Sprite *(X gracillimum x delicatum)* where the *D. X delicatum* 'White/Lilac' was one of the parents. Three plants flowered and all carried large spikes with over nine flowers on them. All flowers were clear whites with the faint lilac spotting on the labellum.

From these flowerings it appears that if an Albino 'Alba' is crossed with a yellow, white flowers result. D. Sun Sprite was remade last year using the same *D. X delicatum* 'White/Lilac' but with a different natural *D. X gracillimum* as the other parent. If these breed white, I shall believe that the Albino 'Alba' parents are dominant over yellows.

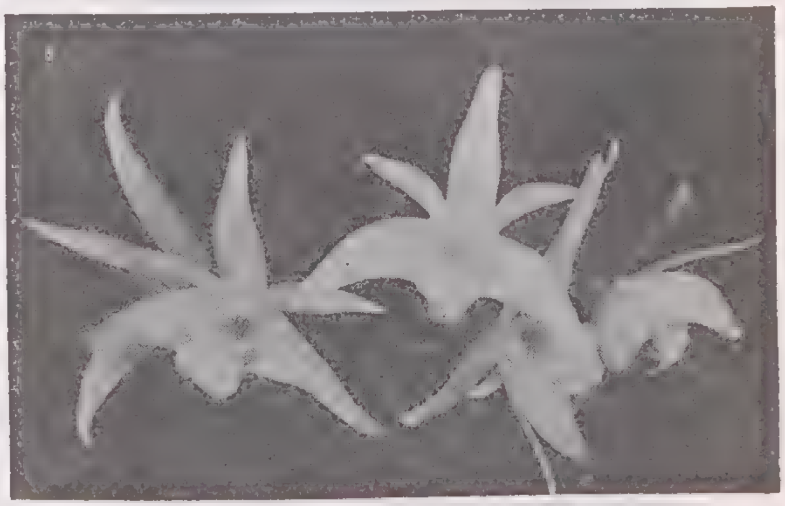

FIG. 6: Dendrobium Ellen 'Snow White'

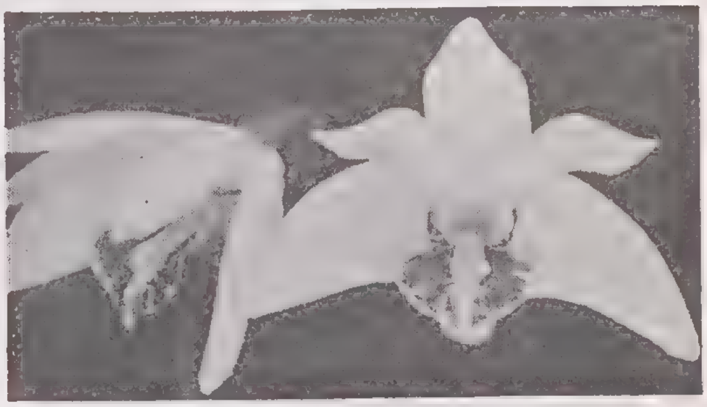

FIG. 7: *Dendrobium kingianum* 'Silcockii'

Quite a number of hybrids have been made using D. Ellen 'Snow White', D. Gillian Leaney 'Frost White', and *D. X delicatum* 'White/Lilac' on to yellows and whites and the flowering of these hybrids in the years to come will be awaited with much interest. In some of these hybrids the perfumed species *D. falcorostrum* has been used and this should give the added benefit of perfume to some of the hybrids.

With all my hybridising I am only working on the genetic colour and flowering properties of the parents and not aiming for round flowers. May I ask that any budding hybridisers who want to work with Australian native orchids refrain from trying to make our natives round, saucer-like flowers, but rather hybridise them for their own individual charm and character.

The culture for these Dendrobium hybrids is basic and simple: they will grow in a bushhouse or an unheated glasshouse. The main danger is frost, so make sure your plants are protected from it in the winter. They require a very open compost. Some materials that are used by various growers are firbark, pinebark, tree-fern mince, charcoal, leafmould and scoria.

A good all-round compost is one made up of firbark, charcoal and tree-fern fibre. Slab culture is another method of growing that is very good. The plants can be mounted on slabs of cork, tree-fern fibre or casuarina logs but care should be taken in the summer to ensure that these plants get copious amounts of water.

In general, give your plants good air movement, filtered light and water when the compost appears dry. You will be rewarded with a beautiful array of prolific flowering, compact growing plants.

16 Rangeview Road (P.O. Box 94)
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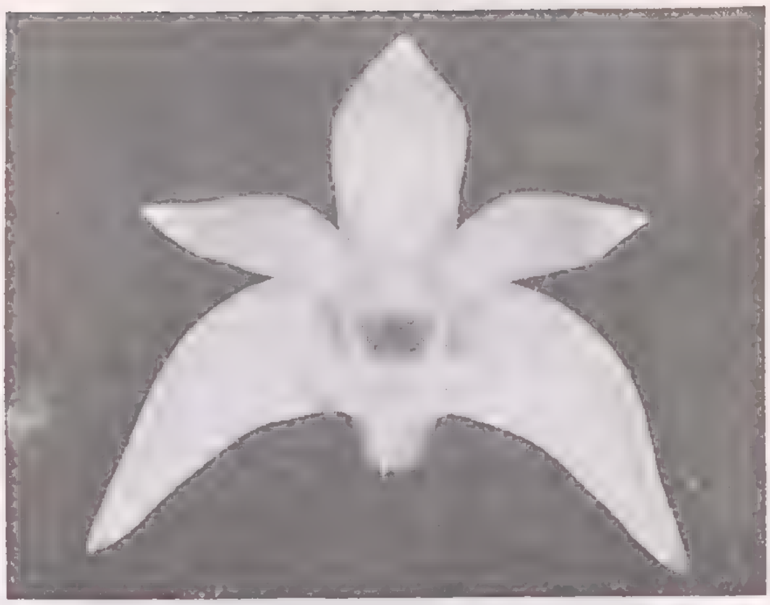

FIG. 8: Dendrobium Kit Murdoch
(= D. Susan x *D. kingianum* 'Silcockii')

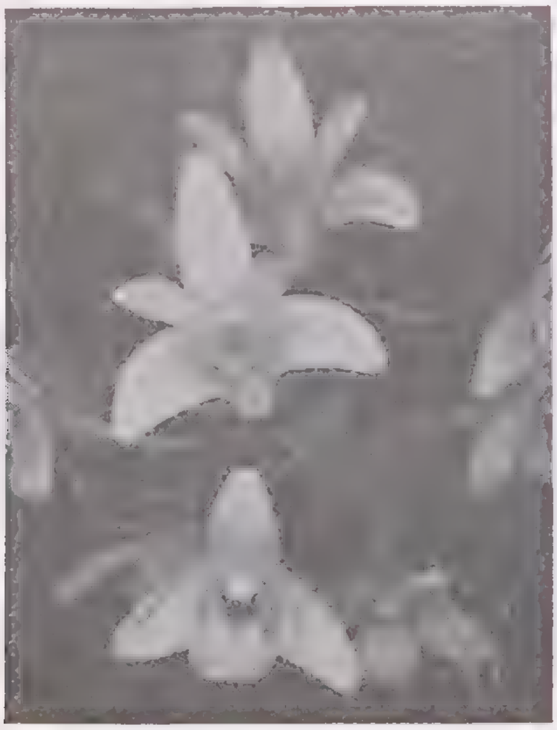

FIG. 9: Dendrobium Delicate Falcon
(= *X delicatum* 'White/Lilac' x *D. falcorostrum*)

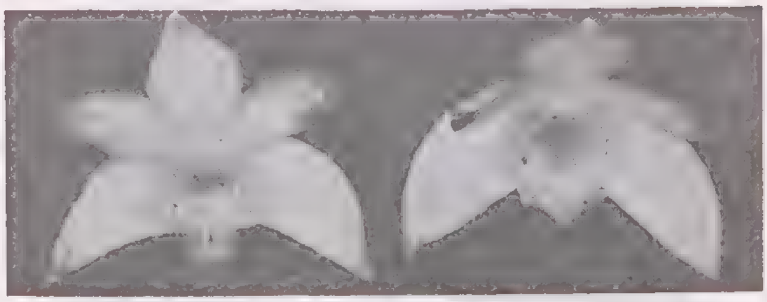

FIG. 10: Dendrobium King Falcon (= D. Kingrose x *D. falcorostrum*). All segments and labellum are flecked pink-purple.

AUSTRALIAN NATIVE ORCHID HYBRID

DENDROBIUM ESME POULTON

by Noel J. Grundon

Dendrobium Esme Poulton was registered by Mr B. Poulton of Brisbane in October, 1978. It is a cross between *Dendrobium bigibbum* and *Dendrobium kingianum* which belong to very widely separated sections of the genus *Dendrobium*. *D. bigibbum* belongs to the *Phalaenanthe* section while *D. kingianum* belongs to the section *Dendrocoryne*. D. Esme Poulton is the first cross registered between the Australian members of these sections.

I have seen only three flowering plants of this cross. The plants were about 7.5 to 10cm high, which suggests that the breeder may have used *D. bigibbum* var. *superbum* subvar. *compactum* as the pod parent. My first impression of the flowers was that they were a purple form of *D. dicuphum*. They were the same size as *D. dicuphum* flowers, about the same open shape but a little more pointed on the petals and the lip wider and pointed as in *D. kingianum*. Although larger than *D. kingianum* flowers, they seemed to me to have lost the appeal of both parents; somewhat disappointing since both parents have produced some very outstanding hybrids when crossed within their own section.

D. Esme Poulton represents a bold attempt to combine the best parents from two different sections of the Dendrobium genus. The breeder's stated aims were to infuse the cold-tolerance of *D. kingianum* with the colour and shape of the 'Cooktown orchid', thus making a cool growing Cooktown orchid with an extended range of culture without heat. He may well have achieved this ambition but at the cost of some of the beauty and appeal of the Cooktown orchid. If this cross breeds, a backcross to *D. bigibbum* may release the genes needed to create a true cool growing 'Cooktown orchid'.

Should this line of breeding be continued? This is a question which will be answered only by trying. I have seen some very worthwhile hybrids between *Dendrocoryne* members and those of the section *Ceratobium*. For example *D. speciosum X D. discolor* and *D. speciosum X D. semifuscum* are worth a place in the collection of the most discriminating grower. They combine the best of both parents; are cool growing although very large in bulb size, and the flowers are very numerous, cream to yellow semi-antelopes. Perhaps there is a message here. *D. bigibbum* and *D. kingianum* are both very dominant in their hybrids, both for colour and shape. Put them together and we do not seem to get a pleasing combination of the dominant genes. On the other hand, *D. discolor, D. speciosum* and *D. semifuscum* are not so dominant in their hybrids and seem to blend their better features with those of the other parent, resulting in many fine hybrids. Could it be that the road to success is to use dominant parents sparingly, and never together? And that hybrids between hot and cold growing species are best done between less dominant species? Witness crosses between *D. tetragonum* and *D. phalaenopsis* (D. Susanne) and *D. bigibbum* (D. Pee Wee). However, A.W. Dockrill, in his book 'Australian Indigenous Orchids', states that while most botanists include *D. tetragonum* in the *Dendrocoryne* section, it is not typical of that section and someday it may be removed to another section. Whatever section it truly belongs to, *D. tetragonum* blends well with members of the sections *Phalaenanthe, Ceratobium* and *Dendrocoryne;* perhaps because its genes are not so severely dominant?

4 Jean Street
October, 1980 TOOWOOMBA, Qld. 4350

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Sarcochilus falcatus
from a colour slide provided by
David Banks.

See "Knowing and Growing
Australian Sarcochilus"
by David Banks on page 230.

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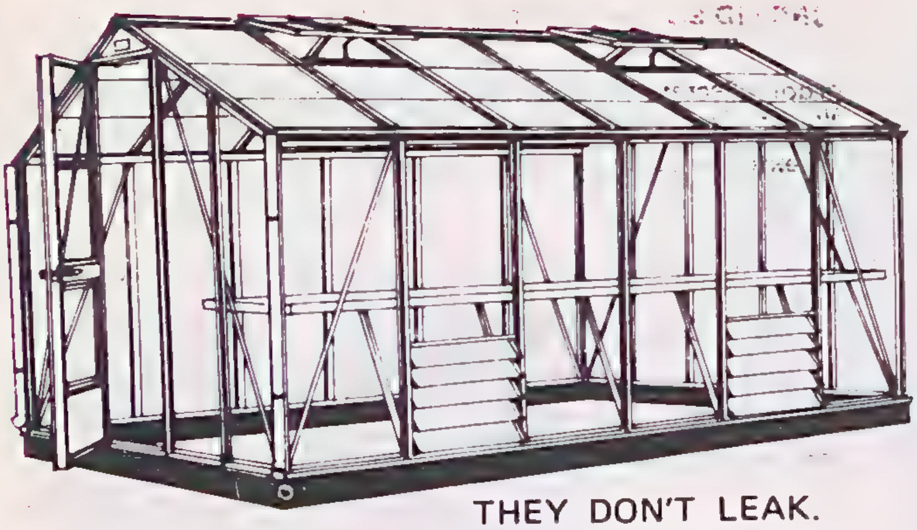

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NATIONAL HERBARIUM
OF
VICTORIA
5 MAY 1981

Dendrobium linguiforme Sw.

MARCH, 1981

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Volume 6 March, 1981 No. 11

EDITORIAL

Another new ANOS Group, covering the far north coast of N.S.W., has been formed (see p. 267) and four new affiliated societies are listed (see "Who's Who" at p. 267). Membership of ANOS continues to increase. Nevertheless we are in trouble. Escalating costs in producing *The Orchadian* have at last overtaken us and we must apologise to readers for the consequent delay in publishing the present issue. We have no intention of lowering the present standard of the journal if this can be avoided; so ANOS Council expects to adopt some important new measures for improving its financial position in the near future. More of this in the June issue, which will be the last issue in Volume 6.

Meanwhile, individual members can help. If every one of you were able to enlist just one new member or subscriber to *The Orchadian* we should be well on the way to our current target of doubling the membership in the next year. Remember that the management of the Society is in the hands of twelve councillors who meet only once each month and that the executive work falls to an even smaller number who give their time and resources freely. Demands upon these voluntary workers become heavier as total membership grows. The Society is no longer small enough to be managed easily in the manner of a local orchid club. But it is not yet big enough to cover its expenses easily. By the nature of its widespread membership it has no recourse to fund-raising of the social kind at regular monthly meetings of the general membership. It is almost entirely dependent upon annual subscriptions; and that is why individual members can perhaps do more than the councillors when it comes to enlisting more subscribers.

FEEDBACK AND FOLLOW-UP:

- At last year's big Spring Show at Mona Vale (Sydney and Warringah Groups' Annual Show) we learned that certain enthusiasts in other States and country areas had **intended** showing some plants there and at the Blue Mountains and District Orchid Society Spring Show, but had left it too late to make the arrangements for transport of plants. Erhard Husted, who has had some experience with arrangements for the forthcoming ANOS display in South Africa has suggested that a similar "foster parents" scheme could be adopted whereby exhibitors in other States could send their plants to Sydney members willing to take care of and enter them in the appropriate competitive sections at the Mona Vale Show. Let us know — either as an exhibitor or as a volunteer "foster parent" — and we shall bring the two together. You may write either to *The Orchadian* or to the Secretary, ANOS, P.O. Box C106, Clarence Street, Sydney 2000. The idea is to send plants well in advance of the show date and have them fostered, brought to flower, safely delivered to and from the show and ultimately returned to the owner.
- Ted Gregory, now of Mt Tamborine, Qld, is President of Southport Orchid Society which meets on the first Tuesday of each month. In a personal letter to me in February he wrote: "If you ever hear of anyone who is likely to be here about a meeting night, give me a yell as we are in need of outside speakers." Now then, all ye who holler for more articles from Ted, why not show your appreciation of what he does for us by offering your services? (See address under his article in this issue.)
- Bill Murdoch, now in his 86th year, asks "May I refer back to a suggestion made some time ago? (*The Orchadian* March, 1979, page 50) Why no Native Orchid Christmas Card?" Bill goes on to offer a donation towards such a project. The answer is that there has been no response at all by the membership. Can it be that nobody reads the editorial page? Or perhaps Christmas cards are going out of fashion? For those who did not read the original suggestion: the idea was that the cards would carry appropriate colour pictures of native orchids and would be produced for sale in quantity to Groups and Affiliates throughout Australia.
- **The Blue Mountains & District Orchid Society is planning a "first ever" one-day Seminar on Australian Native Orchids, for Sunday, 9 August, 1981. Using an impressive panel of speakers, all experts in their fields, B.M.D.O.S. has the backing of the Orchid Society of N.S.W., the AOF and, of course ANOS, whose President will participate in the opening session. The "Proceedings" from this Seminar should provide a valuable publication for native orchid enthusiasts everywhere. More details as to registration, location and subject matter, will appear in our June issue. Meanwhile this is an advance notice — and an early warning that there will be a limit of 200 registrants.**
- A recent letter from Dr P.J. Cribb brought some good news for connoisseurs of fine books on orchids. From *Curtis's Botanical Magazine* (the oldest journal of the kind in existence and certainly one of the most beautiful so far as illustrations are concerned) reprints of all the orchid illustrations from 1971 — 1981 are being published in book form later this year.

Hastings Valley ANOS Group — 1981 Show

President: Mr Lex Barton
Secretary: Mrs Norma Blanch

This active Group has given early notice of its next Spring Show. It will be on Saturday, 10th October, 1981. The ANOS Registrar will again arrange for official judges to attend. Mike Harrison's report of last year's show (see *The Orchadian*, December 1980, page 237) leaves no doubt of the popularity and continuing success of this Group, situated as it is in the orchid-rich central north coast area of N.S.W. Make a diary note of the date. The Secretary's address is: "R.M.B. 360, Pappinbarra Road, Beechwood, N.S.W. 2446". Telephone (065) 85 6150.

Correction: Ben Wallace of Botany Department, University of New England, Armidale, N.S.W. 2351, advises that his article in *Orchadian* Vol. 5, page 169 (March, 1978) should be corrected at paragraph 2 where reference is made to observations by Mrs Coleman on the pollination of *Diuris pedunculata* and *D. aurea.* This should read — *D. sulphurea* (not "D. aurea").

Tubers Galore: The following short note by Les Nesbitt in the NOSSA Journal for February, 1981 is reprinted with his permission: —

> **A terrestrial grower had more species readily available this summer than ever before. Those of us with more than ten years experience, who struggled to build up a collection, adding one or two new species a year, if we were lucky, are perhaps a little envious.**
>
> **When I received the offerings from NOSSA's tuber bank I stopped to think how far things have developed in a few short years. The NOSSA list included 17 species and 5 hybrids. If you drew also from the ANOS — Victoria tuber bank and our Dormant Tuber Catalogue, you could have had an instant collection of 36 species, 2 natural hybrids and 5 man-made hybrids, a total of 43 different orchids. Not bad at all for a new grower. It makes you wonder what the situation will be like in 10 years from now. Will it be 300 species and 600 hybrids?**

A Review of *Dendrobium speciosum* Sm.

by S.C. Clemesha

SUMMARY

In this paper the published varieties of *Dendrobium speciosum* are discussed and it is concluded that *D. speciosum* Sm. var. *speciosum*, *D. speciosum* Sm. var. *hillii* Masters, *D. speciosum* Sm. var. *grandiflorum* F.M. Bail and *D. speciosum* Sm. var. *curvicaule* F.M. Bail. are distinctive varieties which have natural distributions that are separate from each other.

***D. speciosum* Sm. var. *pedunculatum* S.C. Clemesha is described as a new variety (= "var. *compactum*" — in part). *D. x gracillimum* (Rupp) Leaney is shown to be an illegitimate name and the hybrid is given a new name — *D. x gracilosum* S.C. Clemesha. *D. x gracillimum*, *D. speciosum* var. *gracillimum* and *D. speciosum* var. *nitidum* F.M. Bail. are reduced to synonyms of *D. x gracilosum*. *D. speciosum* Sm. var. *bancroftianum* Reichb.f. is not identified.**

Three varieties of *D. speciosum* were described by F.M. Bailey from plants in cultivation in a bushhouse at Bowen Park. This park is near Brisbane General Hospital and it adjoins the Royal National Association Showground. In the late 1800's it was used by the Queensland Acclimatization Society for horticultural purposes. Unfortunately, as discussed later in this paper, the origin of plants from there in at least one and possibly two cases was wrong.

D. speciosum extends from Victoria to North Queensland and a single clone in cultivation was reported to have been collected in New Guinea during World War II. (See details under *D. speciosum* var. *pedunculatum*.)

Most plants I have studied were living ones in cultivation and this is the case except where otherwise stated. I have studied some in their natural habitat and a number of preserved specimens.

D. speciosum Sm. var. *speciosum*

D. speciosum Sm., Exotic Bot. 1 (1804) 17, t. 10; R. Br., Prodr. Fl. Nov. Holl. (1810); Ldl., Gen. Spec. Orchid Pl. (1830) 87; Reichb.f., Beitr. Syst. Pflanz. (1871) 48; Benth., Fl. Aust. 6 (1873) 279; F.M. Bail., Syn. Qld. Fl. (1883) 509 and Qld. Fl. 5 (1902) 1526; R.D. Fitzg., Aust. Orch. 2, pt. 4 (1891) and ined. plate no. 31; Williams, Orch. Grow. Man. 361 (1894); Veitch, Man. Orch. Pl. 74, 75 (1894); Kränzl., Pflanzenreich Heft 45 (1910) 270; Pescott, Orchids Vict. (1928) 15; Rupp, Guide Orchids N.S.W. (1930) 15 and Orchids N.S.W. (1944) 113; Macpherson and Rupp, N. Qld. Nat. 4, no. 43 (1936) 25; Rupp and Hunt, A Review of the Genus *Dendrobium* in Australia, Proc. Linn. Soc. N.S.W. Vol. 72 p. 5—6 (Jan. 1948); Willis, Hdbk. Pl. Vict. 1 (1962) 419; Leaney, Aust. Pl. 1, no. 11 (1962) 32; Dockrill, Aust. Indig. Orch. 384—388 (1969); Nicholls, Orch. of Austr. 109 Pl. 399—400 (1969); J. Rentoul, Austr. Orch. Rev. 40, 1, 19—21 (March 1975) and 40, 2, 95—101 (June 1975); Gregory, The Orchadian 6, — 8, 184, — 186 (June 1980).

Type Specimen:

The Type specimen is in J.E. Smith's herbarium of 20,000 specimens which is held in the herbarium of the Linnean Society in London. My two requests for information or photographs of it from them were not answered, but Mr L. Pedley of the Queensland Herbarium very kindly sent me photographs of it which were taken from the Queensland Herbarium microfiche of Smith's herbarium. It is reproduced with permission of the Director of the Queensland Herbarium.

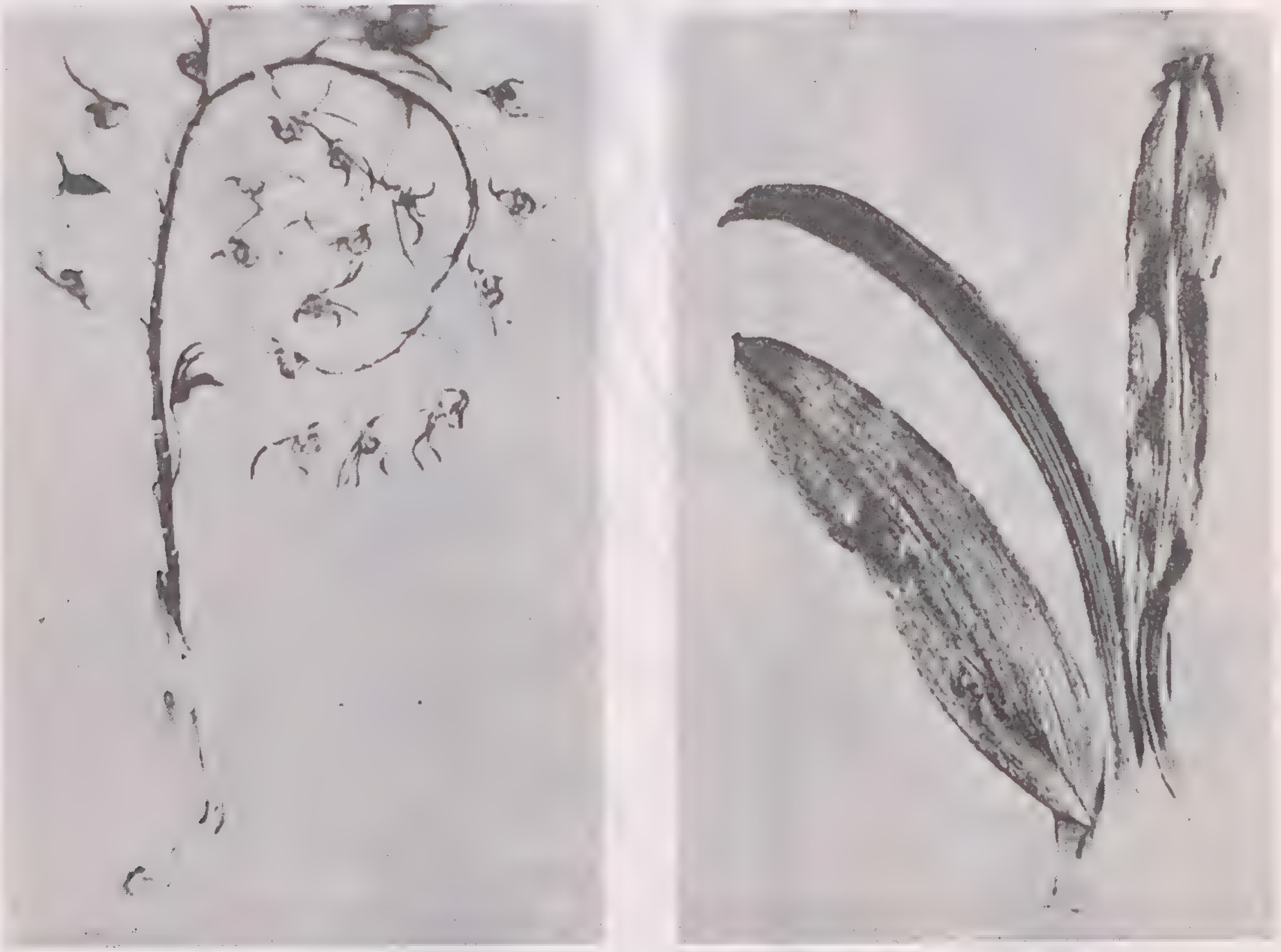
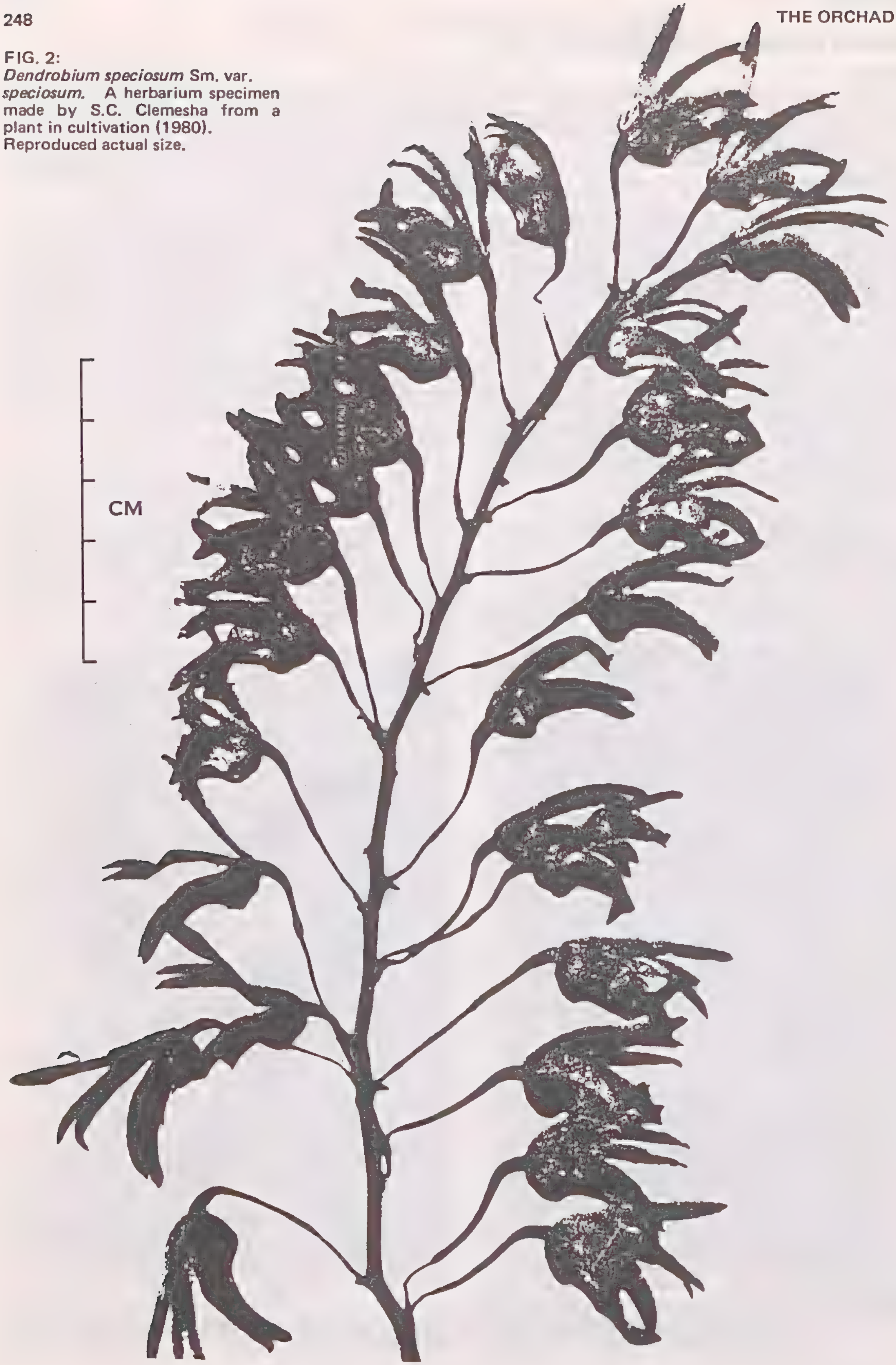


FIG. 1:

Type specimen: *Dendrobium speciosum* Sm. var. *speciosum*.
Port Jackson, New South Wales. Reproduced from a microfiche in the Queensland Herbarium. The original specimen is in J.E. Smith's herbarium (Linnean Society, London).

FIG. 2:
Dendrobium speciosum Sm. var. *speciosum.* A herbarium specimen made by S.C. Clemesha from a plant in cultivation (1980).
Reproduced actual size.



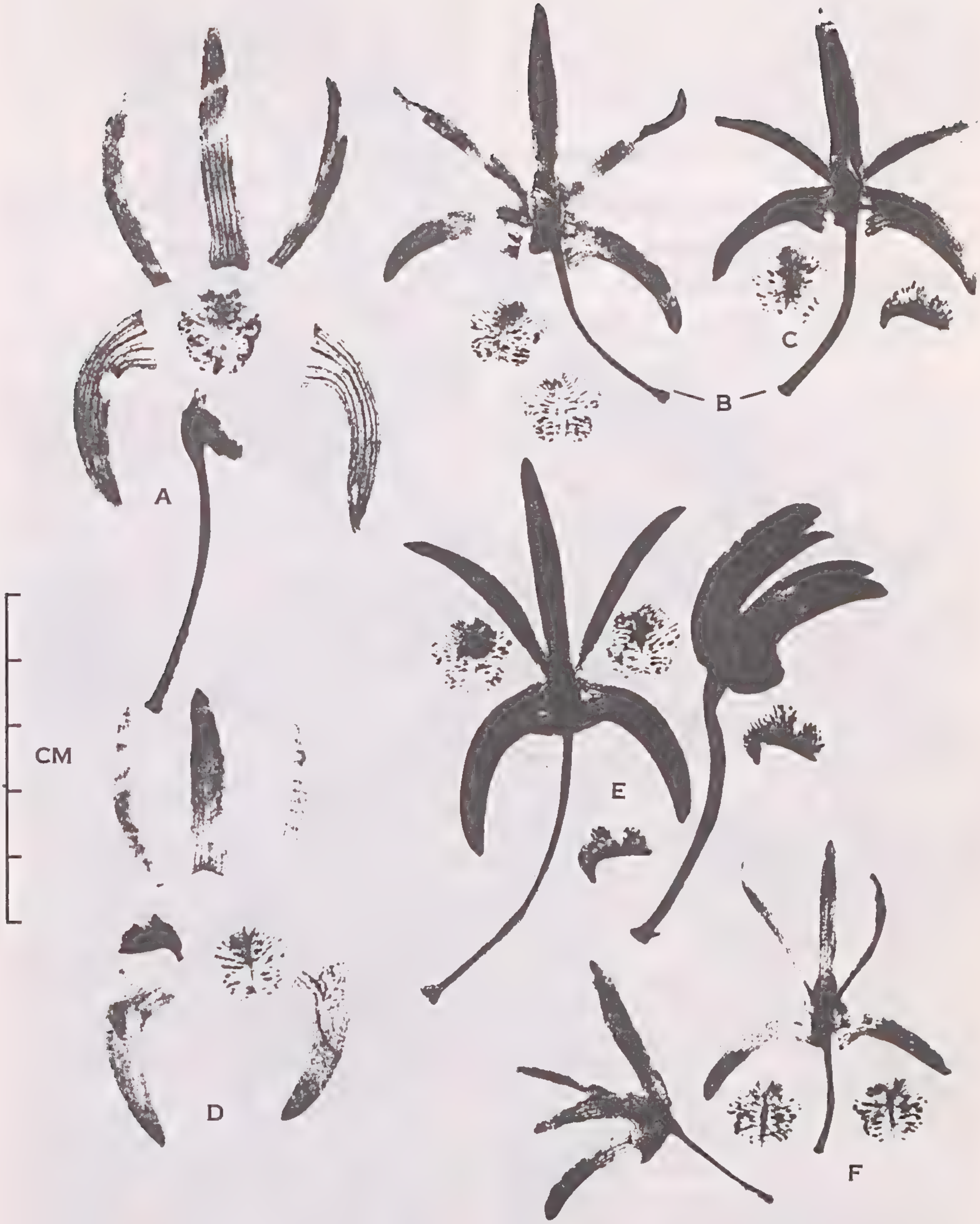


FIG. 3: *Dendrobium speciosum* var. *speciosum*.
Pressed specimens (natural size) from various localities as indicated —

A. Near Cessnock	B. Wattagan	C. Campbelltown
D. Cambewarra	E. Tilba	F. Tathra

(Pressings by S.C. Clemesha, 1980 from plants in cultivation.)

On the Type sheet is written: —

"Port Jackson New South Wales"

In the general area around there the var. *speciosum* is the only one found and at the time it was described it was plentiful. FitzGerald in *Australian Orchids*, 2, 4 (1878) stated "*Dendrobium speciosum*, about thirty years ago, was common on all the sandstone cliffs about Sydney, and on such outlying rocks as were large enough to afford safety from bushfires." Today it still exists in remote areas of the Sydney-Hawkesbury district.

Original Description:

A transcription of J.E. Smith's original description (1804) follows —

"*DENDROBIUM speciosum* Great *Dendrobium*

GYNANDRIA Diandria.

"Nectary a lip without a spur. Petals 5; the 2 lower external ones forming a pouch with their base. Lid vertical. Flowers often reversed.

"Flowers reversed. Cluster solitary, many-flowered. Lip three-lobed. Leaves radical, coriaceous.

"Grows on rocks and trees in New South Wales, where the natives call it Wer-gal-derra. It is a fine species of a new genus formed by Dr Swartz, with great judgment, out of the *Epidendrum* of authors, another species of which is my *E. Barringtoniae,* Ic. Pict. Plantarum, t. 15; but in that the flowers are not, as in this, reversed.

"The stem is short and thick. Leaves almost entirely radical, from 6 to 12 inches long, very tough and rigid, oblong, entire. Cluster solitary, on a scaly stalk, simple, consisting of a great number of alternate stalked flowers, of which our plate can admit but a few of the lowermost. From their greenish colour I should expect them to be fragrant at night. The 5 petals are oblong; the 2 lowermost (or in this reversed species the upper-most) forming a pouch, or short spur, round the base of the lip, which itself has no spur. The lip is 3-lobed, concave, green spotted with red. Column crowned by the vertical moveable cap or lid. Capsule obovate."

Both the description and plate that accompanies it are barely recognizable but in the latter the labellum is large compared to the other tepals as is usual for the Type variety.

Plant Habit:

The stems in this variety are thick at the base (up to 8cm in diameter) and they taper upwards. They are shorter than those of most varieties and many stems are 30cm or less tall, but they do grow to about 45 or more cm tall. Some are stained with reddish pigment, especially in winter, while others are devoid of this. The stems may be straight but often they are slightly curved and in large clumps, some curve into half circles. The leaves are flat or quite concave on the upper surface.

Flowers:

Normally about 20 to 60 or more flowers are produced and they vary from under 2.5cm to 4cm or more long. On the New South Wales south coast large-flowered plants occur in some areas close to where small-flowered plants occur. A study of individual clones in cultivation for a number of years has shown that the size of flowers of individual plants is consistent and varies little from year to year. The flowers of var. *speciosum* are more spaced than in other varieties as is shown on the Type specimen. Some are less so than others and an occasional one is rather full. Plants in cultivation vary little in this regard from year to year also.

In the northern parts of its distribution near Cessnock and at Bulahdelah, the flowers of this variety that I have seen growing in cultivated collections are white but further south they are mostly cream or yellow. Some plants are consistent from year to year in flower colour but I was given a piece of a plant with deep yellow flowers and for me the following year it flowered very pale and did not significantly deepen with age. In yellow specimens the labellum usually is paler.

Labellum:

The labellum often is proportionately larger than other varieties especially in larger flowers where it is over a third the length of the other tepals. A study of plants in cultivation has shown that in this and all the other varieties, the markings on the labellum vary from flower to flower on the same raceme. The markings on one side of the central ridge do not match those on the opposite side. The overall impression of heavily or lightly marked is consistent from year to year.

There is great variation in all varieties in the degree of labellum markings.

Abnormal Specimens:

The only abnormal specimens of *D. speciosum* I know of were found by Mr W. Upton in the central coast area of New South Wales and their flowers are consistent each year. Both grow in populations of normal plants and I have seen coloured transparencies of them.

One plant has flowers which entirely lack labellum side lobes. Otherwise the flowers are normal.

The other is a plant which carries normal purple anthocyanins in its pseudobulbs but the labella of the flowers lack any purple markings whatsoever. Ted Gregory in *The Orchadian* loc.cit. reports having a clone of a north Queensland plant of *D. speciosum* that has pure white flowers.

I have observed two plants of *D. ruppianum* forma *magnificum* and one of *D. ruppianum* forma *ruppianum* which also have flowers which entirely lack labellum markings though purple anthocyanins are present in the plants.

Distribution:

D. speciosum var. *speciosum* occurs from Paterson and Bulahdelah, New South Wales, south to Victoria. Most plants grow on rocks in open forest, but in some rainforest areas they grow on trees, e.g. Clyde Mountain and the Illawarra district. North of Paterson and Bulahdelah this variety is replaced by var. *hillii.* The change-over seems to be abrupt and clear. I have examined herbarium specimens of both varieties from Bulahdelah and both were as distinct and clear as any examples of the two varieties I have seen. That is true also of a Paterson herbarium specimen of *D. speciosum* var. *speciosum.* I have examined specimens labelled "var. *speciosum*" from northern New South Wales and Queensland. In all cases the specimens represented other varieties.

Small flowered specimens of var. *speciosum* are sometimes mistaken for var. *hillii* but they differ in having spaced flowers which have labella that are much larger than those of var. *hillii.*

D. speciosum Sm. var. *hillii* Masters

D. speciosum Sm. var. *hillii* Masters, Gard. Chron. 7, (January 27, 1877) p. 112, 114; F.M. Bail., Syn. Qld. Fl. (1883) 509 & Qld. Fl. 5 (1902) 1526; Kent in Veitch, Man. Orchid Pl. 1 (1888) 74, t. facing 74; R.D. Fitzg. in Moore & Betche, Hdbk. Fl. N.S.W. (1893) 384; R.D. Fitzg,. ined. plate no. 92; Williams, Orch. Grow. Man. (1894) 361; Rupp, Orch. N.S.W. (1944) 114.

Syn. *Dendrobium hillii* Hook.; Curtis's Bot. Mag. 87 (1861) t. 5261 (illegitimately published); F. Muell., Fragm. Phyt. Aust. 3 (1862) 39 (illegitimately published); non F. Muell. 1859 now *Sarcochilus hillii* (F. Muell.) F. Muell.

Type Specimen:

The Type specimen of *D. hillii* Hook. is held at Kew. Mr J. Wood of the Kew Herbarium kindly sent me a photograph of it. It is reproduced with permission of the Controller of Her Majesty's Stationery Office and the Director of the Royal Botanic Gardens, Kew.

The flowers are 21mm long and are a good match for specimens of this variety commonly seen. They are densely packed on the raceme.

The Type specimen was taken from a cultivated plant that was sent from Brisbane by Mr Walter Hill, superintendent and botanist of the Botanic Garden at Brisbane.

Masters's description has been overlooked by recent Australian authors. His name is not stated in the article, but Dr M.T. Masters, the then editor of *The Gardeners'*

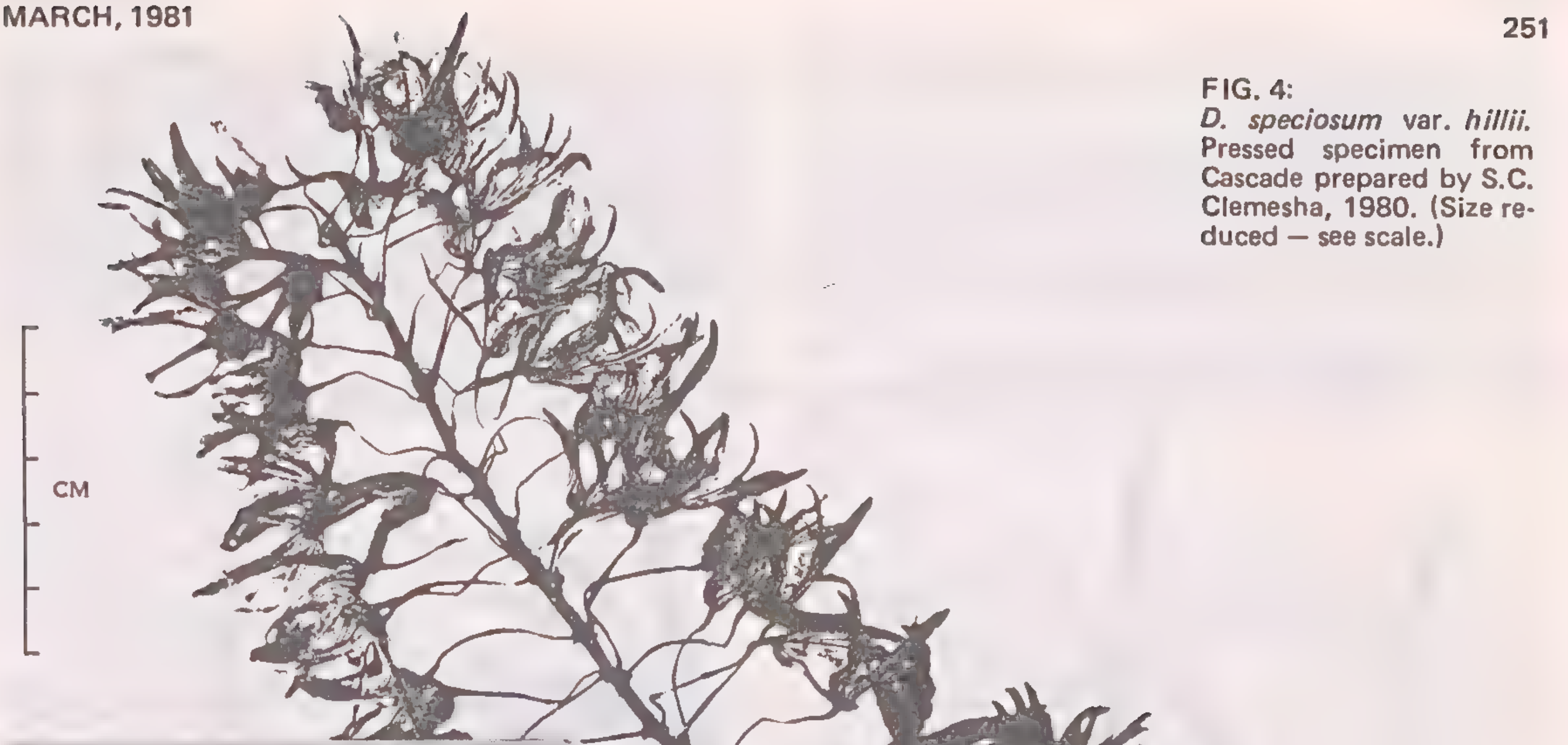


FIG. 4:
D. speciosum var. *hillii.* Pressed specimen from Cascade prepared by S.C. Clemesha, 1980. (Size reduced — see scale.)

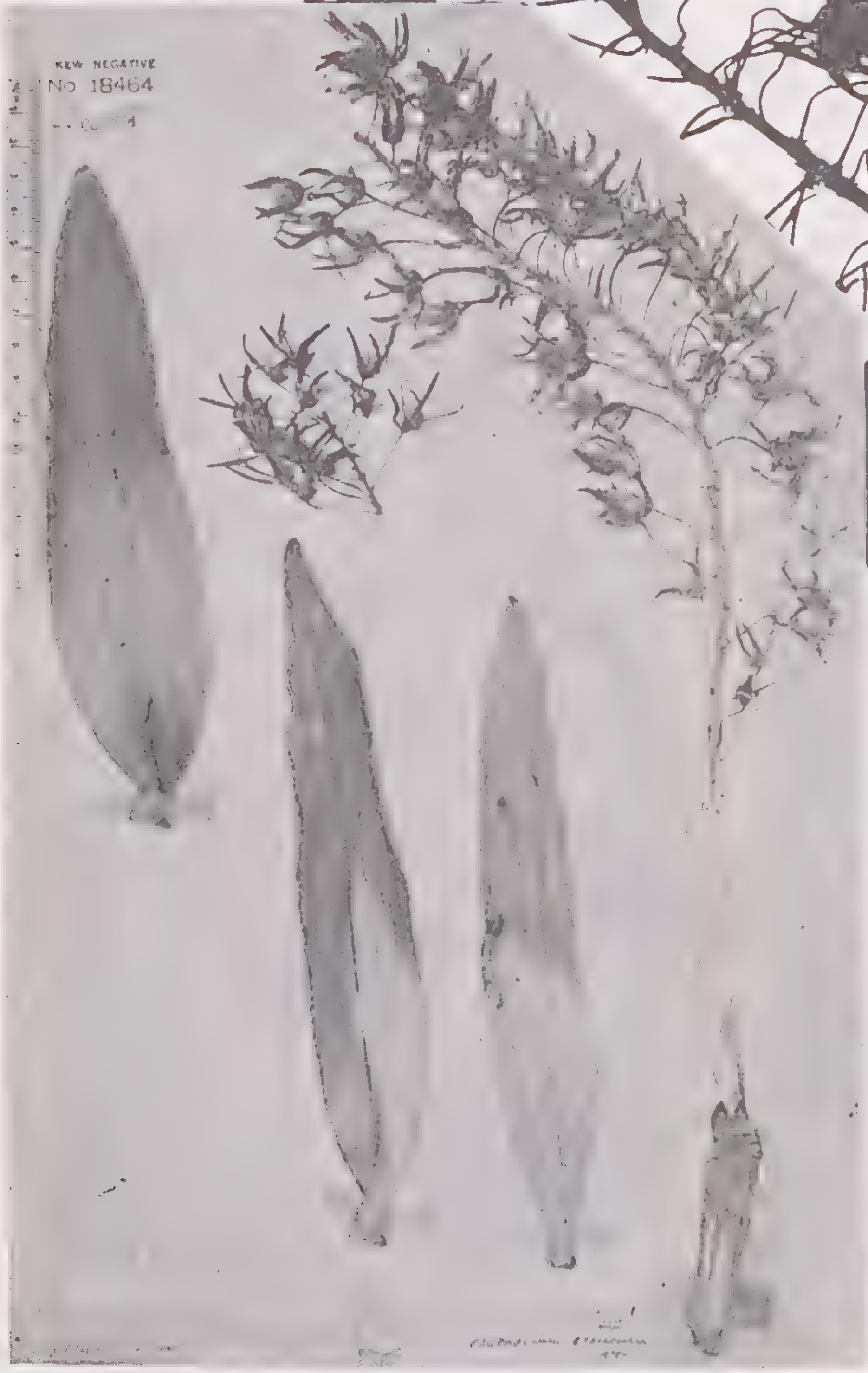


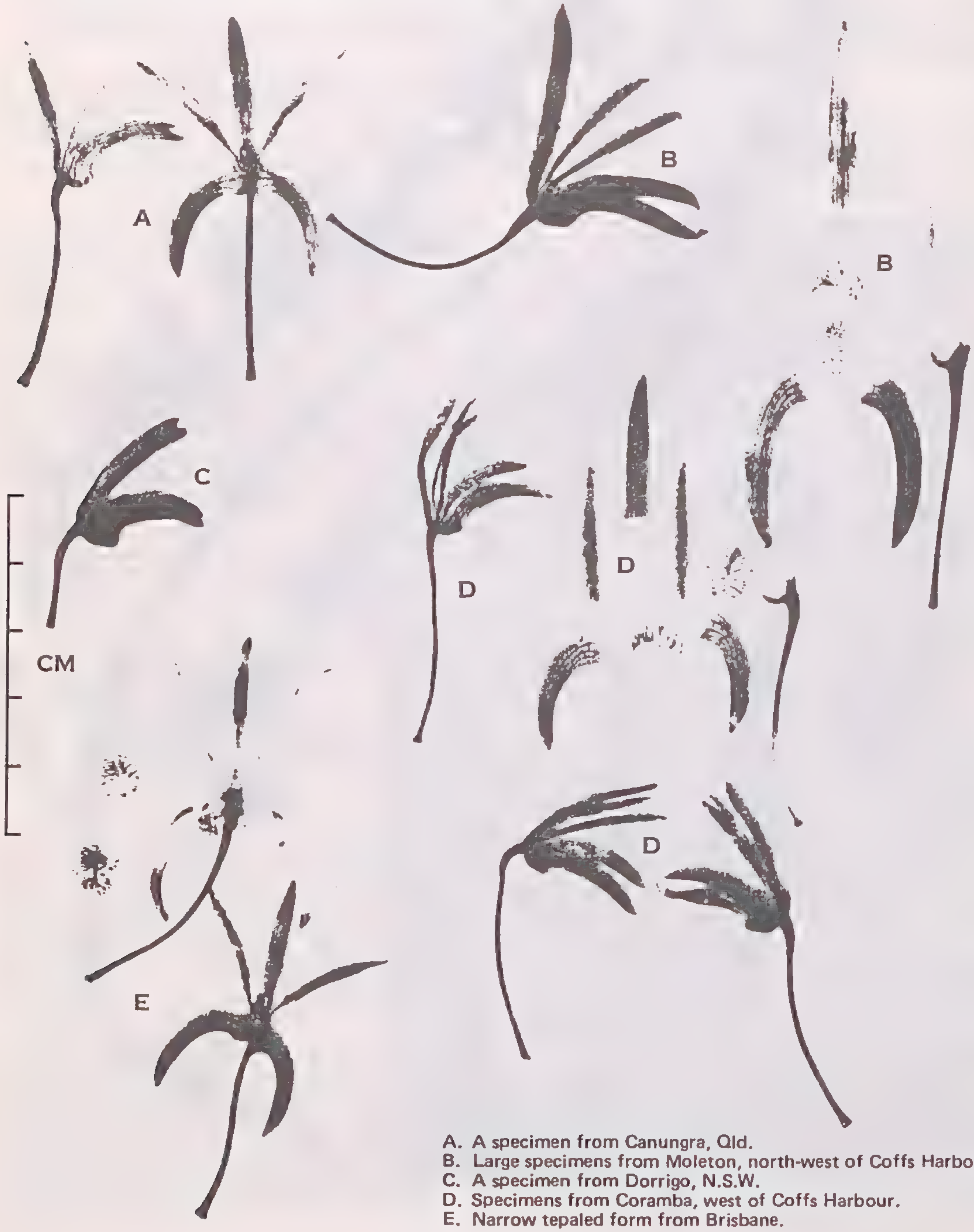
FIG. 5:
Dendrobium speciosum **var. *hillii* as *D. hillii.***
Type specimen at Royal Botanic Gardens, Kew.

Chronicle, uses the word "we" to indicate his magazine's articles and this is used to begin his description. A transcription of this follows.

Original Description:

"We are glad of the opportunity of figuring the magnificent Australian *Dendrobium speciosum* var. *hillii* (fig. 18), for its merits are less known than they deserve to be. Few more glorious sights have met our eyes than that which greeted us on opening a package lately from the Hon. and Rev. J.T. Boscawen — Our page will only allow us to give a portion of one spike, but it may suffice to give an idea of its massiveness and beauty. The variety *hillii,* figured in the Botanical Magazine 5261, differs from the old *speciosum* in its narrower and longer sepals and petals, as pointed out by Baron von Muller. The stems also are more elongated. The plant is a native of tropical Australia, Queensland, but the species extends into the cooler southern latitudes of New South Wales and Victoria.

FIG. 6: *D. speciosum* Sm. var. *hillii* Masters.
Pressed flower specimens (natural size) from localities indicated (S.C. Clemesha, 1980).



A. A specimen from Canungra, Qld.
B. Large specimens from Moleton, north-west of Coffs Harbour.
C. A specimen from Dorrigo, N.S.W.
D. Specimens from Coramba, west of Coffs Harbour.
E. Narrow tepaled form from Brisbane.

The flowers are of a creamy white colour, and have a pleasant fragrance. Compared with its Indian allies the present plant requires but little heat, and it usually flowers freely every year from the same bulb. Sometimes it flowers twice in the year and last year Mr Boscawen's plant flowered a third time from the same pseudobulb — a very unusual occurrence. Nothing could be finer and more healthy than the foliage which accompanied these magnificent spikes. Mr Boscawen's plan of culture, however, is very simple. After flowering the plant is allowed to rest for a month or six weeks; it is then placed in an intermediate house and copiously watered every day till the pseudobulbs are formed, when it is placed out-of-doors or in an orchard-house in the sun."

In the above description Masters refers to Hooker's description and therefore Hooker's type is the type of the variety and not Mr Boscawen's plant. This latter may not have been preserved. Clearly, however, both descriptions and plants represent var. *hillii* and there seems no detectable difference between the two.

The plate accompanying the original description is a good example of the variety. The flowers are dense, the tepals are the usual shape and width — they are not very curved — and the labellum is the usual size in proportion to them (over 1/3 the length of the other tepals). The stated flower colour is the normal one for this variety.

The author of *D. hillii* Hook. is Sir William Jackson Hooker whose name is indicated by "Hook." or "Hk." Rupp, loc. cit., Nicholls, l.c., Dockrill, l.c., and E.G. Gordon (in 6th World Orchid Conference Commemorative Brochure p. 40) all gave "Hook.f." or "Hk.f." as the author of *D. hillii* but this is incorrect since it represents his son, Sir Joseph Dalton Hooker.

Hooker loc. cit., Masters l.c., Veitch l.c. and Mueller l.c. all stated that var. *hillii* had longer narrower tepals than the type variety while Bailey, l.c., stated that the flowers were larger. In Australia it is more usual for flowers of var. *hillii* to have shorter, narrower tepals than the Type variety but in England in cultivation Hooker's and others' statements could have been true.

Plant Habit:

Plants of *D. speciosum* var. *hillii* have stems which usually are much taller than those of var. *speciosum* — up to about 1 metre or more tall and up to 3—4cm or more thick. They usually are straight and taper little throughout.

Under hard conditions in the wild they can be as short as 20cm but they are still straight and little tapered; so they remain distinguishable from those of the Type variety.

Flowers:

The flowers vary in size from 1.5 to 3.0cm long. They are usually much more crowded and much more numerous than in other varieties, particularly var. *speciosum*.

Mostly the flowers are white or pale cream. Some become yellow soon after opening but in New South Wales this is not common. A division of one plant was given to me by a friend. His piece flowered a cream colour in the spring of 1980 while mine flowered yellow. The reverse occurred with a clone that was sent from Brisbane and had unusually narrow sepals and petals which curved a little more than those of other specimens of var. *hillii* I have seen.

Labellum:

The labellum is the same shape as in the Type variety and in var. *grandiflorum* but is much smaller and as with other varieties it is variably barred and spotted with purple but on the whole to a much lesser degree. It is not unusual for labella of var. *hillii* to have few markings on the apical half.

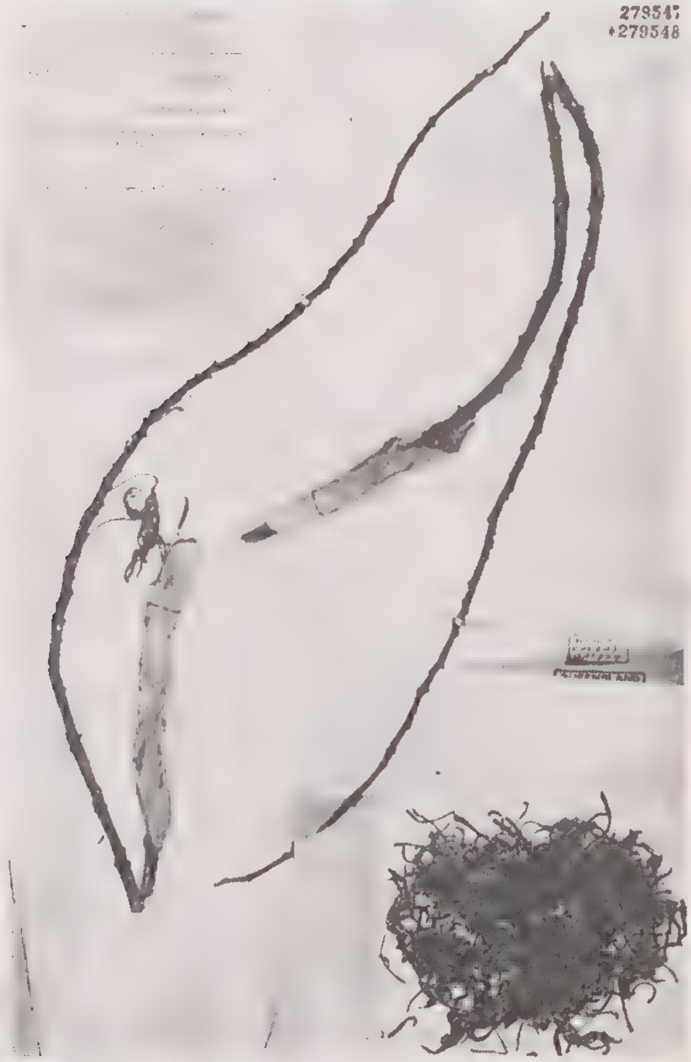


FIG. 7: *D. speciosum* var. *grandiflorum* F.M. Bail. Type specimen in the Queensland Herbarium showing "Eumundi — September 1894". A handwritten label by Bailey reads "A beautiful yellow, white when reaching Brisbane".

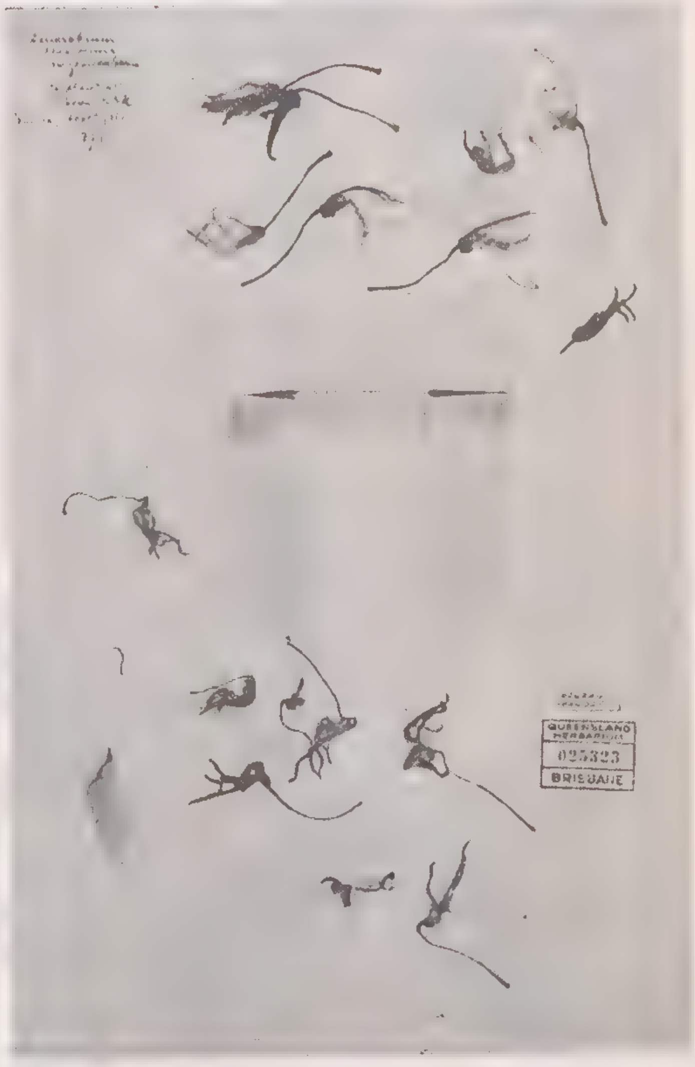


FIG. 8: *D. speciosum* var. *grandiflorum* in Queensland Herbarium. Bailey's handwritten note reads — "Off plant at Bowen Park, Sunday, September 12th, 1896."

Distribution:

This is the only variety of *D. speciosum* occurring in northern N.S.W. and extreme southern Queensland.

Except for a solitary record by Rupp (from a cultivated plant from Mangrove Mountain near Gosford) I have not been able to find any evidence of the existence of var. *hillii* south of the Hunter River. I have examined the Mangrove Mountain specimen. It appears to be var. *hillii* but its flowers are somewhat less crowded than usual.

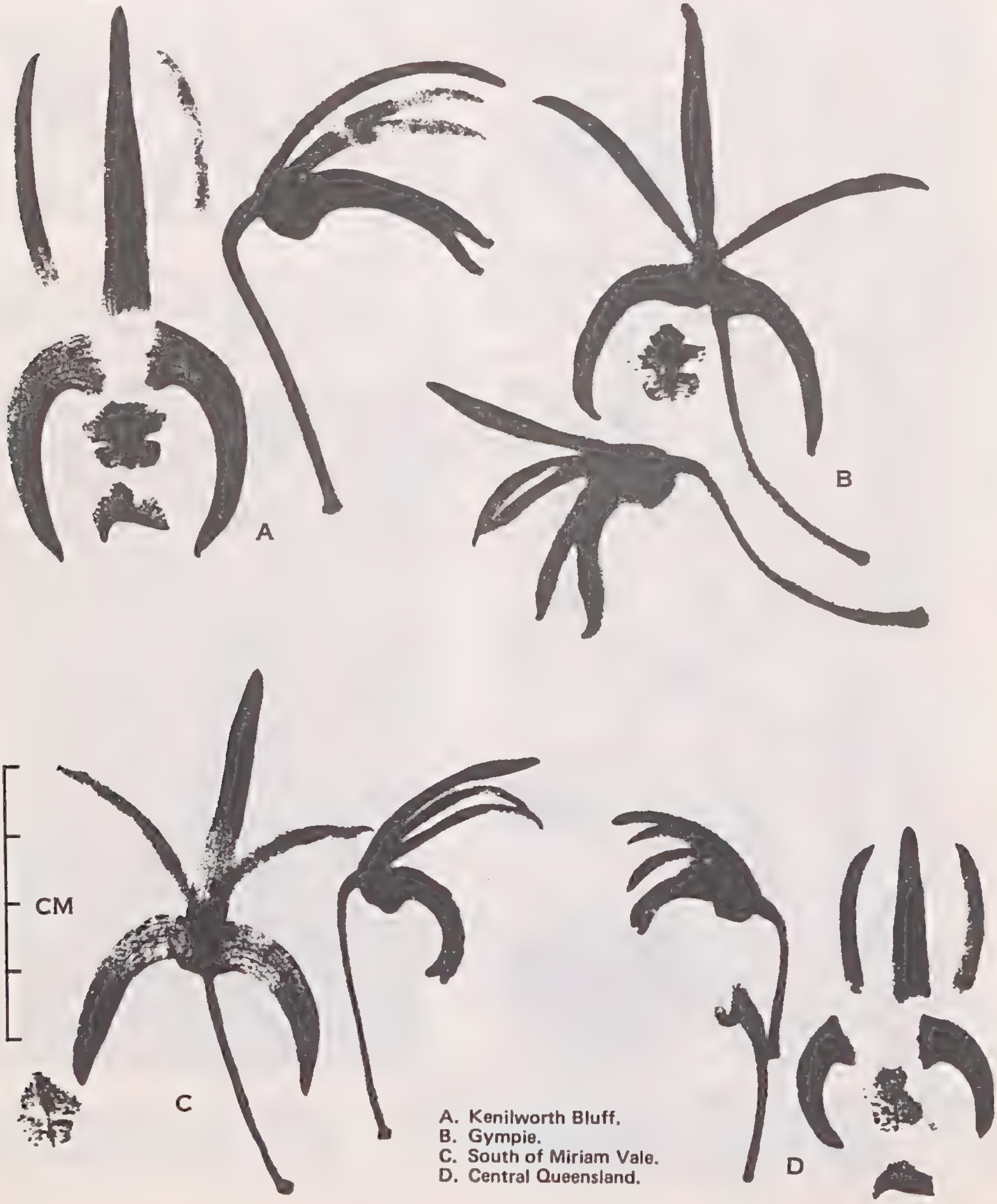
It is replaced by var. *grandiflorum* between Brisbane and Nambour in Queensland. A specimen labelled var. *hillii* from the Bunya Mountains that is in the N.S.W. National Herbarium is var. *grandiflorum.*

I have seen no evidence of intermediates between var. *hillii* and other varieties.

Throughout its range, var. *hillii* is fairly constant. One cultivated specimen I have seen west of Coffs Harbour, N.S.W., has large flowers 3cm long but otherwise is typical.

A characteristic of var. *hillii* and var. *grandiflorum* is the production of aerial roots. These occur to a lesser extent in other varieties.

FIG. 9: *Dendrobium speciosum* Sm. var. *grandiflorum* F.M. Bail.
Pressed flowers (natural size) from localities indicated (A—D).



A. Kenilworth Bluff.
B. Gympie.
C. South of Miriam Vale.
D. Central Queensland.

Specimens prepared by S.C. Clemesha, 1980.

D. speciosum Sm. var. *grandiflorum* F.M. Bail.

D. speciosum Sm. var. *grandiflorum* F.M. Bail., Botany Bull. Dep. Agric. Qld. 14 (1896) 12; Dockrill, Austr. Indig. Orchids (1969) 386.

D. speciosum var. *hillii* Masters forma *grandiflorum* (F.M. Bail.) F.M. Bail., Qld. Fl. 5 (1902) 1526.

D. speciosum forma *grandiflorum* (F.M. Bail.) Kränzl., Pflanzenreich Heft 45 (1910) 271.

Type Material: (Figs 7 & 8, p 253)

The Type material of this variety is in the Queensland Herbarium and Dr R.W. Johnson, the Director, kindly sent me photographs of it. It is with his permission that two of them are reproduced here. It can be seen from these that the flowers have long, curved sepals and petals and short labella only about 1/5 to ¼ the length of the other tepals and this is common in this variety.

With the specimens is a drawing of an outline of a leaf and the stem. The stem section is straight and parallel as is common for this variety and var. *hillii* and the leaf is broadly lanceolate, showing no unusual characteristics.

From Bailey's description and comment on the Type sheet ("a beautiful yellow . . .") it is evident that he was very impressed with the Type plant. This strongly suggests he had not seen it before and evidently it was not commonly cultivated in Brisbane in the 1890's. Today it is still much less commonly cultivated there than the more local var. *hillii*.

Original Description:

A transcription of the original description of this variety follows: —

"This variety has the strong, more vigorous habit than *D. speciosum* var. *hillii*; the leaves often over 1 ft. long (30cm) and near ½ ft. (15cm) broad. The distinction, however, is mostly in the flowers, which are of deep yellow from first expanding until they decay; the segments are 1½ inch long (3.8cm), the outer ones 3 lines (6mm), the inner ones 1½ lines (3mm) broad. Labellum very obtuse and barred throughout with purple.

"Hab.: Eumundi, and plant now (September) flowering at Bowen Park."

Though the Type material is ample and in good order and the description clear, with measurements given, this variety has not readily been recognized. The reason is the undue emphasis placed on the description of the habit. People have looked out for an extra large plant.

Plant Habit:

The habit of this variety is usually not large. Some plants flower at only 30cm tall, while most are taller and quite slender. Over all, the habit of this variety is less massive than that of var. *hillii* though the two varieties cannot usually be separated by vegetative characteristics alone.

Flowers:

The flowers of this variety are much less crowded than in var. *hillii* but they are much closer together than in var. *speciosum*. When racemes of the latter and var. *grandiflorum* are compared, those of var. *speciosum* often appear quite sparse beside var. *grandiflorum*. Because of the fullness of the racemes, their being as long as those of the two more southern varieties and their attractive colour, it is seldom that a plant of another variety can match this one in beauty.

The individual flowers range from about 3 to 5cm in length. The lower sepals are a little shorter than the dorsal and they are more curved than in var. *hillii* and var. *speciosum*. The sepals and petals vary from very pale to deep yellow. The colour deepens with maturity. I know of no specimens of var. *grandiflorum* with white flowers, except for some from near Rockhampton that are discussed later.

Labellum:

The labellum is a very pale sulphur colour and it bears, to a varying degree, numerous transverse purple lines — many more than in var. *hillii*. It is obtuse, as stated in the original description, and much larger than that of var. *hillii*. This is particularly evident when flowers of the two, which are about the same size, are compared. The labellum is very short when compared to the other tepals, as the pressed specimens show.

Relationship to Other Varieties:

I have not seen any evidence of intermediate specimens between var. *hillii* and var. *grandiflorum*. The change from one variety to the other seems as abrupt as that between var. *speciosum* and var. *hillii*.

In Qld. Flora, l.c., Bailey reduced var. *grandiflorum* to a form of var. *hillii*. As described above, there is considerable morphological difference between the two.

The flowers of var. *grandiflorum* resemble var. *speciosum* but they differ in being more closely packed, having more curved lateral sepals and a shorter labellum. The plant habit also is different. These two varieties are isolated from each other as var. *hillii* grows in between their respective ranges.

Distribution:

I have seen cultivated plants of this variety from eight localities from Kenilworth to near Miriam Vale. Through its range it is the only variety that is found.

A Dwarf Race:

At the Byfield Range, near Rockhampton and inland at least to the Carnarvon Range, plants of *D. speciosum* grow which have short stems about 14cm tall. From what I have seen of them they do not flower unless grown in strong sunlight in cultivation or in the wild. If growing in shade, the plants produce slender stems which are still quite short.

Two Rockhampton orchid growers have told me that around there the flowers of the plants are white. I have seen flowers of two clones only of these short growing plants. Both were from the same locality about midway between Rockhampton and the Carnarvon Range. One specimen was a living plant in cultivation. The raceme was 30cm long and bore over 70 flowers and was an impressive sight on such a small plant. The individual flowers were 2.3cm long but were typical var. *grandiflorum* in shape and colour. The tepals were very thick in texture. The other specimen I have seen is a herbarium specimen at the National Herbarium of New South Wales. Its floral segments are only 1.8cm long but again have the shape of var. *grandiflorum*.

I can only conclude that these plants are a dwarf race of var. *grandiflorum* but need to see more material before I can be sure of this.

Intermediates:

I have seen living plants in cultivation from three localities between Miriam Vale and Rockhampton which have a habit about intermediate between that of var. *grandiflorum* and the Rockhampton, etc. race. I have not seen flowers of these plants.

D. speciosum Sm. var. *nitidum* F.M. Bail.

D. speciosum Sm. var. *nitidum* F.M. Bail., Proc. R. Soc. Qld. 1 (1884) 10 and Syn. Qld. Fl. Suppl. 1 (1886) 52 and Qld. Fl. 5 (1902) 1526; Rupp & Hunt, A Review of the Genus *Dendrobium (Orchidaceae)* in Australia — Proc. Linn. Soc. N.S.W. Vol. 72 parts 5-6 (January 1948); W.H. Nicholls, Orchids of Australia 109 pl. 401 (1969); Dockrill, Austr. Indig. Orch. 388 (1969).

Type Specimens?: (See Figs 10 & 11)

Two specimens of this variety with F.M. Bailey's handwriting on them are in the Queensland Herbarium. Dr R.W. Johnson, the Director of the Herbarium, kindly sent me photographs of these and the information on them and it is with his permission that they are reproduced here.

He stated that one of these (the one from which all flowers have fallen) could be the Type but no date or locality is stated. The sheet has a handwritten label by F.M. Bailey which states: — "*Dendrobium speciosum* var. *nitidum*". "Collector unknown" is typed on it. The absence of a comment by Bailey strongly suggests this specimen is the Type.

A handwritten note by Rupp is attached to the sheet. It states: — "I cannot distinguish between these specimens of *D. speciosum* var. *nitidum* (except the Tamborine Mtn plant) and the N.S.W. form named by me in 1929 *D. speciosum* var. *gracillimum*, and I believe them to be identical. If this be so, the varietal name *gracillimum* must disappear. I did not consider var. *nitidum* when describing the N.S.W.

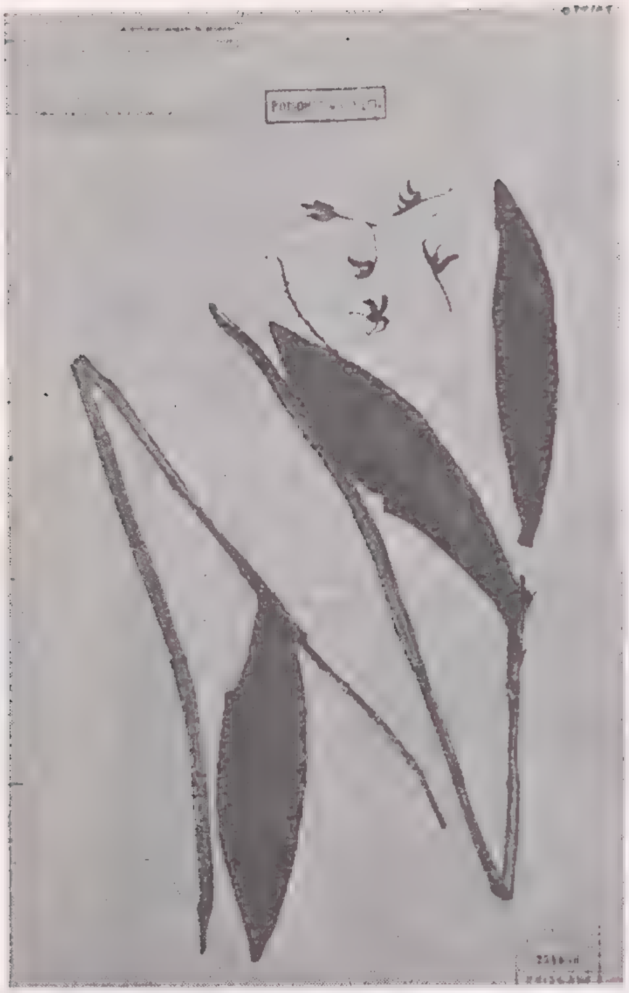


FIG. 10: *D. speciosum* var. *nitidum.* Photograph of a specimen in the Queensland Herbarium with handwritten label by F.M. Bailey.

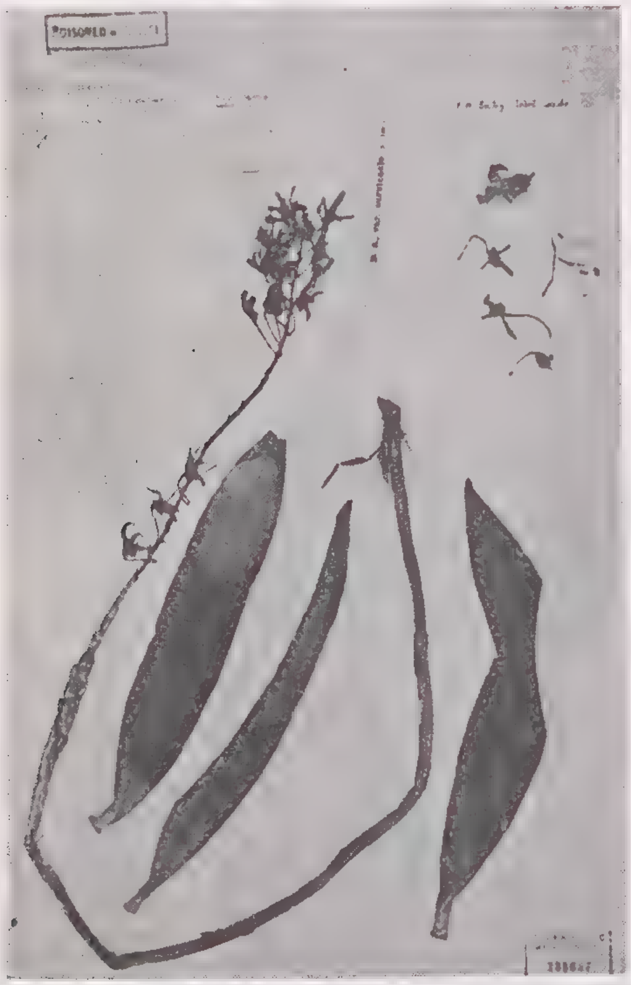


FIG. 11: *D. speciosum* var. *nitidum.* Queensland Herbarium label in C.T. White's handwriting. Field label — F.M. Bailey's handwriting.

form because (1) I had been shewn a form supposed to be *nitidum* which is quite different from the Q'land. Herbarium specimens, (2) F.M. Bailey gives for *nitidum* the locality 'Tropical Queensland'. Although var. *gracillimum* differs from the type *nitidum* in Queensland Flora in often having fewer flowers, coloured cream or yellow (as well as sometimes being white), the whole character of the two agrees so closely that it does not seem worthwhile maintaining varietal separation. — H.M.R. Rupp
Weston, N.S.W., 9.11.31."

The second specimen of *D. speciosum* var. *nitidum* labelled by F.M. Bailey contains the date 14/9/1894 and "A Plant at Queensland Acclimat. Soc. garden Bowen Park Brisbane" — handwritten by C.T. White. There is also a note handwritten by F.M. Bailey which states: — "This seems only to differ from the specimens I described my *Dendrob. speciosum* var. *nitidum* from in its yellow blooms and in the normal form the white or yellow colour is not constant and the dots upon the leaf which may be a disease."

In Qld. Flora Bailey described the leaves of var. *nitidum* as "prominently pitted on the upper face" so it would seem to be this plant he was referring to.

In the N.S.W. National Herbarium there is one specimen labelled *D. speciosum* var. *nitidum.* I have examined this specimen. Mr D.F. Blaxell has redetermined it as *D. x gracillimum.* The specimen consists of one rather small raceme. On the specimen in Dean's handwriting is written "*Dendrobium nitidum* R.D.F. 9/85 Locality (Q) R.D. Fitzgerald's garden Hunter's Hill 9 — 1885".

The specimen also has a note by Rupp attached to it: — "It seems probable that the plant from which this was taken was identified by F.M. Bailey himself. There is no doubt that it is very close to if not identical with *D. gracillimum* Rupp but see Rupp in Vict. Nat. for March 1945 — *D. gracillimum* Stat. nov."

Rupp and Hunt in A Review of the Genus *Dendrobium* (1948) state: — "Unfortunately there are no certified specimens of var. *nitidum* in existence."

Original Description:

"Stems strong and numerous, forming large masses like var. *hillii,* from 1½ to 2 ft. high (45—60cm) of a nearly even diameter of about ½ inch (1.3cm), usually smooth and shining, fluted, nearly free from torn bases of old leaves; leaves 3 to 5 lanceolate, 6—7 inches long (15—17cm), 1½ to 2 inches broad (3.7—5cm), coriaceous, the upper surface usually shining. Racemes 6—8 inches long (15—17cm), bearing from 24 to 30 flowers, at first yellowish green, afterwards pure white, pedicels over 1 inch (2.5cm) long, spur short, outer segments 6 to 7 lines long (13—15mm), and about 2 lines broad (4.5mm); the inner segments or petals about the same length, but narrower than the outer. Labellum short, the lateral lobes marked with transverse purplish lines, the middle lobe apiculate, the longitudinal plates yellow. Hab. Cairns. Collector unknown.

"Described from plant blooming at Bowen Park. This form differs from others chiefly in its short, dense raceme and glossy foliage."

The original description of *D. speciosum* var. *nitidum* is followed by that of *D. speciosum* var. *delicatum* and in this mention is made of the stems swelling at the base and the flowers distant. These points would seem to be a comparison with var. *nitidum.*

The description of var. *nitidum* fits *D. x gracillimum* well. I had reached this conclusion before I became aware of the existence of the specimens.

D. speciosum var. *nitidum* F.M. Bail. was named earlier than *D. speciosum* var. *gracillimum* Rupp and both represent the same taxon. The latter name therefore is illegitimate as is *D. x gracillimum* (Rupp) Leaney (more often used as *D. gracillimum* (Rupp) Rupp) because it is based on it.

D. speciosum var. *bancroftianum* was published earlier than var. *nitidum* but its identity remains uncertain. The part of its description concerning its stems fits this hybrid; so to avoid the possibility of the need for a future name change I am not giving var. *nitidum* a new status but am giving the hybrid a new name.

D. x gracilosum S.C. Clemesha hybr. nov.

Planta inter _D. gracilicaule_ F. Muell. et _D. speciosum_ Sm. intermedia omnibus partibus. _Caules_ 20—60cm x 0.9—1.3cm diametro quasi equo omnino. _Folia_ 3—5,8—20cm x 24cm, oblonga usque ad obovata anguste. _Racemi_ 10—25cm longi, floribus 12 minimum. _Sepalum dorsale_ 12—18 x 3—4mm, oblongo-obtusum, sepalis lateralibus similis sed latioribus. _Petala_ breviora aliquantum quam sepalum dorsale et dimidia latitudine. _Labellum_ 6—10mm longum, trilobatum, lobis lateralibus erectis, lobo medio latiore quam longiore et maculato rubello. _Columna_ 3 x 2cm.

Plant intermediate between *D. gracilicaule* F. Muell. and *D. speciosum* Sm. in all its parts. Stems 20—60cm x 0.9—1.3cm of a near even diameter throughout. Leaves 3—5, 8—20 x 24cm, oblong to narrow-obovate. Racemes 10—25cm long with 12 or more flowers. Dorsal sepal 12—18 x 3—4cm, oblong obtuse. Lower sepals similar but broader. Petals slightly shorter than the dorsal and half its width. Labellum 6—10mm long, 3-lobed; side lobes erect; mid-lobe broader than long and marked with reddish spots. Column 3 x 2cm.

Type:

From a cultivated plant collected with appropriate authority at Moleton, north-west of Coffs Harbour, by S.C. Clemesha in September, 1978. It grew in a locality where *D. speciosum* var. *hillii* and *D. gracilicaule* were plentiful. The plant flowered in cultivation at Coffs Harbour in September, 1980. The Type specimen is in the N.S.W. National Herbarium.

The name *"gracilosum"* is a composite of the specific epithets of the parents of the hybrid.

Origin of Bailey's Specimens:

Apart from Bailey's reports in his descriptions, *D. x gracilosum* has not been recorded from anywhere in the tropics.

Its parent species are found in the highlands of north Queensland but there *D. gracilicaule* is much less plentiful than in the south. In my experience *D. x gracilosum* only occurs as occasional plants where *D. gracilicaule* is abundant and some plants of *D. speciosum* var. *hillii* are present. The area of north Queensland where hybrids between *D. speciosum* and *D. gracilicaule* could occur naturally is not very large but it none-the-less could; though it would involve a different variety of *D. speciosum.* I have crossed north Queensland plants of both species artificially and they set seed readily which, when flasked, germinated freely.

It seems likely that Bailey's plants of *D. x gracilosum* were not from the tropics at all. The collector was unknown, so one wonders how the locality could be known.

A plant of *D. xgracilosum* in my collection and others I have seen in other collections have fine pin-hole-like dots on their leaves and it is likely that these are the same type of dots to which Bailey referred. I do not know what causes them, but suspect it is insects. I have seen pitting on leaves of *D. speciosum* var. *hillii* also, but not of this type.

Confusion with *D. x delicatum*:

Rupp mentions a "Tamborine Mountain Plant". This specimen was collected by Miss Hilda Geissmann (Mrs Curtis) from Tamborine Mountains area (rare) in September 1924. It was not seen by F.M. Bailey since he had died in 1915.

Nicholls in "Orchids of Australia" illustrated this clone. Mrs Curtis had cultivated the plant and sent him a specimen. The plate is dated 1934. In the late 1960's she gave a piece of the plant to Mr M. Corrigan of Sydney, as *D. speciosum* var. *nitidum* from Tamborine Mountain. Mr Corrigan gave me a piece of the plant, which flowers each spring. It is *D. x delicatum.* It has loose-flowered racemes — as is usual for it. The white flowers have faint pink shading outside.

D. x gracilosum and *D. x delicatum* are very easy to distinguish when fresh but are much more difficult from dried specimens — consequently the error in identification is understandable.

Confusion with Another Variety:

Dockrill in Austr. Indig. Orch. (page 388) concludes that var. *nitidum* probably represents a poorly grown plant of the Type variety that has grown under grossly unfavourable conditions.

The Type variety of *D. speciosum* occurs only in central and southern N.S.W. and Victoria but at the time Dockrill wrote this, this was not clear.

Small flowers of north Queensland plants of *D. speciosum* do match *D. x gracilosum* in size and commonly they are white so it is easy to see how Dockrill came to his conclusion.

D. speciosum stems, however, do not flower when they are as slender as Bailey described and they never are 45—60cm high and only 1.3cm in diameter. If they are as slender as that, they are from plants in deep shade and such stems are well under 45cm tall and they will not flower even if the plant is moved into better light. I have studied many shade-grown plants with Dockrill's statement in mind. Some plants of *D. speciosum* from shade have tall, slender stems but if one puts a ruler to them and measures them, they are always well over 1.3cm in diameter if the plant is in flowering condition.

D. speciosum Sm. var. *bancroftianum* Reichb.f.

D. speciosum Sm. var. *bancroftianum* Reichb.f., Gard. Chron. 15 (1881) 782; F.M. Bail., Contrib. Qld. Fl. 11 (Oct. 1896); Kränzlin, Pflanz. Heft 45 (1910) 271.

D. speciosum Sm. var. *hillii* Masters forma *bancroftianum* (Reichb.f.) F.M. Bail., Contrib. Qld. Fl. 11 (Oct. 1896).

Type Specimen:

The Type specimen of this variety, if it exists, is in the Vienna Herbarium. My first request for a photograph of it was not answered so I then sent specimens of var. *hillii* and var. *grandiflorum* to compare with it. No reply has been received since these were sent.

Original Description:

"This is an interesting variety. Its flowers are much like those of the genuine plant, but the petals are a trifle longer, hence more antennate; the lip is of the lightest sulphur colour, with a few minute atoms of purple at the base, and the keel running from the base to the middle is dark yellow, and a similar darker yellow line runs from the middle lip through the middle of the anterior lacinia. The stem is even more slender than that of *Dendrobium hillii,* Hook., and that alone affords a good mark for distinction. It was sent from Brisbane by Dr Bancroft, whose name it justly may bear. It flowered in the garden of his friend, Mr Thomas Christy, who earns so many thanks just now for the publication of his 'New Commercial Plants and Drugs'."

Bailey in Qld. Flora reduced this variety to a form of var. *hillii.*

The first part of his description differs from the original description. It is: "Plant with the robust habit of *D. speciosum* var. *hillii,* but segments of flower longer and narrower."

Reichenbach compares it to var. *speciosum* — not var. *hillii.*

Bailey in Bot. Bull. 14, 12 (1896) stated: "The only specimens I have seen which might belong to the above (var. *bancroftianum*) were flowering in the Bowen Park bushhouse, and Mr Soutter informed me the plants were received from Mt Dryander."

In Qld. Flora l.c. (1902) he gave the habitat as "supposed to be a northern form".

The only specimens of *D. speciosum* which ever have tepals longer and narrower than those of var. *speciosum* are var. *hillii* and var. *grandiflorum.* The labellum evidently was not heavily marked and this is suggestive of var. *hillii.*

Reichenbach emphasised slender stems in his description. Kränzlin, l.c., identified var. *bancroftianum* with *D. x delicatum.* Since Reichenbach gave no measurements, this possibility cannot be overlooked. *D. x gracilosum* also has much more slender stems than var. *hillii.* If Reichenbach's understanding of var. *speciosum* and var. *hillii* was not good it is possible that var. *bancroftianum* could re-

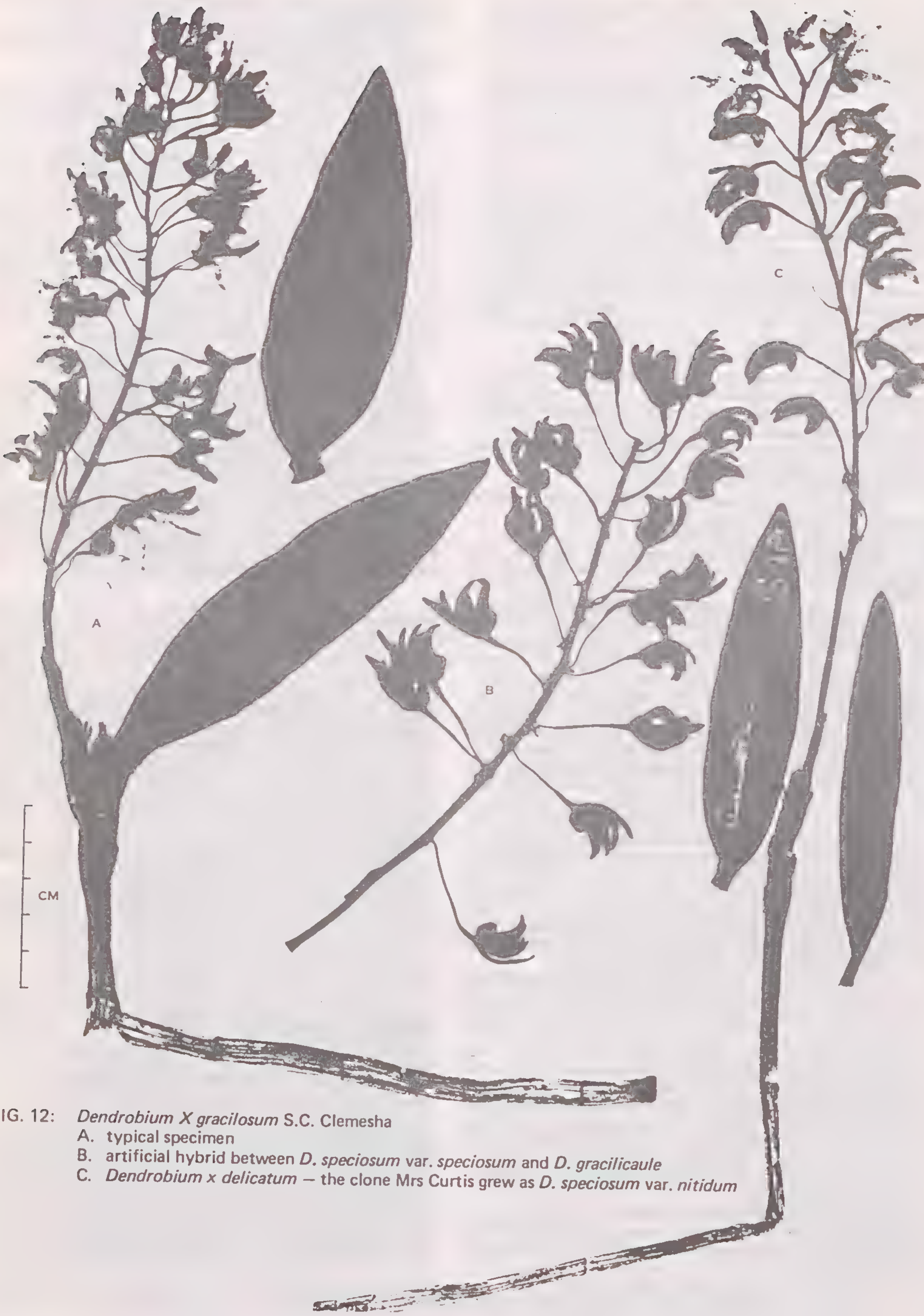


FIG. 12: *Dendrobium X gracilosum* S.C. Clemesha
- A. typical specimen
- B. artificial hybrid between *D. speciosum* var. *speciosum* and *D. gracilicaule*
- C. *Dendrobium x delicatum* — the clone Mrs Curtis grew as *D. speciosum* var. *nitidum*

Specimens prepared by S. C. Clemesha 1980.

present the same taxon as one of the above mentioned hybrids.

The identity of var. *bancroftianum* will remain uncertain until the Type specimen of it is examined.

D. speciosum var. *curvicaule* F.M. Bail.

D. speciosum var. *curvicaule* F.M. Bail., Bot. Bull. 14, (1896) 12; Qld. Fl. 5 (1902) 1526; Rupp & Hunt, A Review of the Genus *Dendrobium* in Australia, Proc. Linn. Soc. N.S.W. Vol. 72 p. 5–6 (1948); Dockrill, Austr. Indig. Orch. 388 (1969).

Type Specimen?: (See fig. 14).

In the Queensland Herbarium there is only one specimen of this variety which has F.M. Bailey's handwriting on it. It contains no date or stated locality and the collector is unknown. Probably it is the Type or at least a specimen from the same plant.

Dr R.W. Johnson, the Director of the Queensland Herbarium, kindly sent me a photograph of this specimen which is reproduced here with his permission.

The specimen contains little material — a half moon structure is a floral bud and another is near it. These and the one flower do show that the flowers had short broad segments. These were described in the original description. A transcription of this follows.

Original Description:

"Stems curved, some almost into a half-circle, compressed, 9—12 inches long (22—30cm), the broad diameter often obtaining 1½inches (3.8cm). Leaves very coriaceous, oblong, the end somewhat pointed, about 5 inches long (12.7cm), 2 inches (5cm) broad, often concave. Peduncle with raceme 9 or 10 inches (22 or 25.5cm) long, bearing numerous cream-coloured flowers; bracts of the peduncle exceeding 1 inch (2.5cm) long, cymbiform, quite coriaceous. Pedicels 1 inch (2.5cm) long. Sepals 5 or 7 inches long (in error for lines) (13—15mm), 3 lines broad, (6mm) thick, linear curving outwards. Petals linear, about as long as the sepals, thick, glossy, curving outward, 1 to 1½ lines broad (2—3mm). Labellum falling away from the column more than any of the other forms of this species; in its natural position about 2/3 the length of the other segments, of thick coriaceous substance like the other parts of the flower, lateral lobes longer than broad, middle lobe broad as long, slightly apiculate. Disk bearing a thick ridge, all parts of the labellum marked with thick purple bars and the base of the column and disk stained with an orange colour. Column short, spur broad, anther small, pollen-masses light-coloured.

"Hab. Lady Elliot's Island, from whence Mr Soutter received the plants now (September) flowering in the bushhouse, Bowen Park. The present with var. *fusiforme* and var. *delicatum* being in general appearance so different from other forms of this species, will likely in cultivated collections receive specific rank."

In the Queensland Flora, l.c., the error regarding lines and inches is corrected but another is made. This is: "Labellum the lateral lobes embracing the very short column, the column (in error for labellum) in its natural position about 2/3 the length of the other segments."

Type Locality?:

Lady Elliot Island is a true coral cay that is ringed entirely with beaches. When the island's position was fixed in 1816 it was stated to be "covered with grass and trees". Eighty years later most of the flora was destroyed when the island was dug over for its phosphate-rich guano. All the high parts of the island were removed in this mining. It was lowered about 5 metres. After the miners left, goats were introduced to the island and they stopped any regrowth of flora until they died out in the early 1960's. The island now is recovering and one tourist pamphlet described it as "an unspoilt, totally natural coral island".

It is now very low lying and flat and it has no rocky outcrops. Guano forms a hard rock and possibly *D. speciosum* grew on this. It is obvious from the habit described that var. *curvicaule* was a rock growing plant.

It has not to my knowledge been found on other islands (all cays) of the Bunker and Capricorn groups, although some of these have guano rock deposits which have not been mined. Mr N. Anderson has searched islands of the Capricorn group extensively to see epiphytic orchids growing in their natural state, but he found none and concluded that the habitat was too dry. *D. speciosum* does not grow on any other coral cay to my knowledge.

On the Queensland Herbarium specimen, the collector is given as unknown and in the original description it is clear that Soutter received the plants — not that he collected them. Since the collector was unknown, one wonders how the locality was known. The collector of var. *nitidum* — also described from a plant at Bowen Park — was unknown and the attributed habitat of Cairns almost certainly was incorrect.

I have not seen a single clone of *D. speciosum*, from the Tropic of Capricorn southwards, which has short broad sepals as described for var. *curvicaule*. Lady Elliot Island is off the part of the Queensland coast where var. *grandiflorum* is found. If var. *curvicaule* really grew on Lady Elliot Island then it was an outlying stand of the north Queensland plants. This is possible, though not very likely.

It is more likely that Bailey's plant of var. *curvicaule* really was from north Queensland, since all of the plants I have studied (living and preserved) from Mackay northwards, have short broad segments and small examples fit Bailey's description in size.

The racemes of this variety are shorter than in the southern varieties and the flowers open more widely. In small examples the labellum is about 2/3 the length of the other tepals. These points all agree with Bailey's description.

Though this variety varies little in tepal shape and in having comparatively short racemes, it varies considerably in other ways.

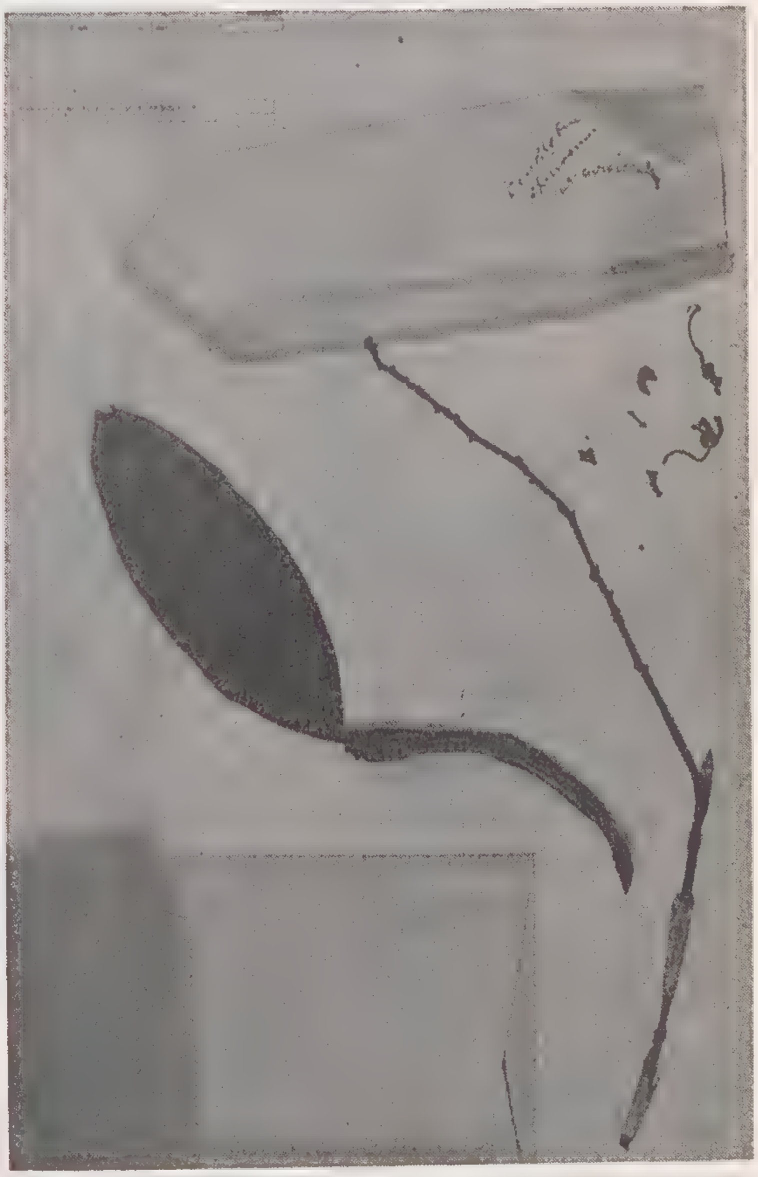


FIG. 13: *D. speciosum* var. *curvicaule*.
F.M. Bailey's handwriting is on the packet at top of photograph.

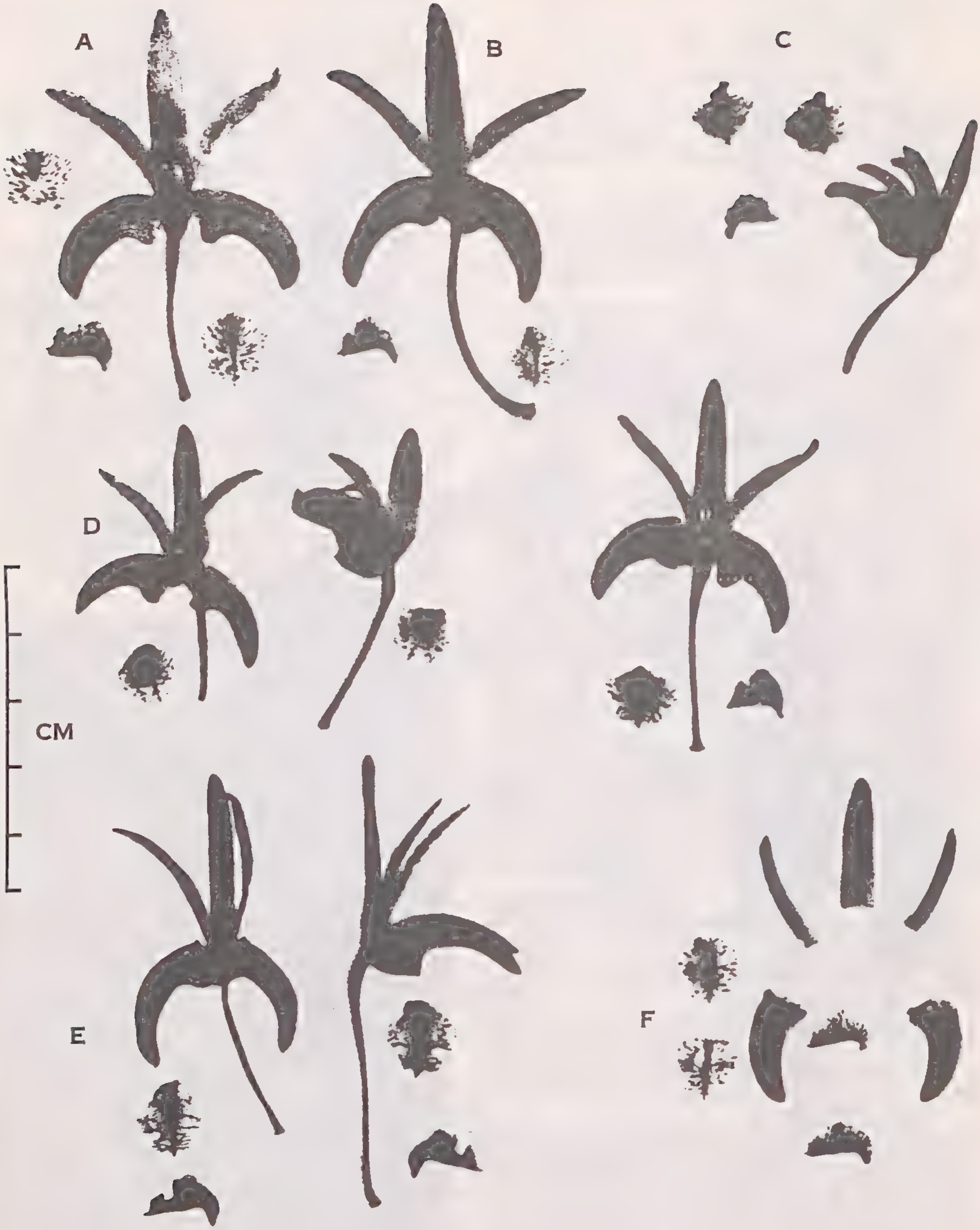


FIG. 14: *D. speciosum* var. *curvicaule* F.M. Bail. — Pressed flowers (natural size) from localities indicated A – F.

A, B and C – from near Mackay, Queensland.
D – from near Ingham, Queensland.
E – from near Kennedy, Queensland.
F – from near Gillies Highway, south-west of Cairns, Queensland.

Specimens prepared by S.C. Clemesha, 1980.

Habit:

Plants of this variety are variable in stem size and shape. They will flower on stems from 7 to about 100cm tall. Many plants have stems which are narrow at the base and they taper gradually and are widest near the apex. Often they are flattened, being much broader than thick. Bailey's plant probably was like this since he mentions — "the broad diameter often obtaining one and a half inches". I have not seen plants of southern varieties with flattened stems. Most of the plants I have seen from near Mackay and Ingham have curved stems but this is not common further north.

Flowers:

The flowers of plants of this variety are white or creamy — the latter being the usual colour for plants from near Mackay, while white is more common further north. Most flowers of this variety I have examined are not very heavy in texture but some from Mackay are much heavier than the others.

Labella:

Most flowers of this variety from the northern part of its range have the labellum mid-lobe separated from the lateral lobes by a short neck. This is absent on flowers I have examined from near Ingham and near Mackay. The labellum markings vary considerably — from absent (rare) to very heavy. Many examples have rather fine markings, but some of the plants from near Mackay have larger markings and approach the condition Bailey described — "thick purple bars".

Distribution:

I have studied living specimens of this variety from near Mackay to near Thornton's Peak. It grows from the coast to the highlands but is most common at higher elevations. The dry area of central Queensland isolates this variety from the southern varieties.

D. speciosum Sm. var. *pedunculatum*
S.C. Clemesha var. nov.

***Caules* 5—16cm alti, foliis rigidis durisque, pedunculo rigido, erecto, fuscissimo et longiore quam rhachidi. *Flores* segmentis brevissimis latissimisque. *Labellum* magnum ex comparatione tepalis.**

Stems 5—16cm high, leaves stiff and hard, peduncle rigid, erect, very dark and longer than the rhachis. *Flowers*

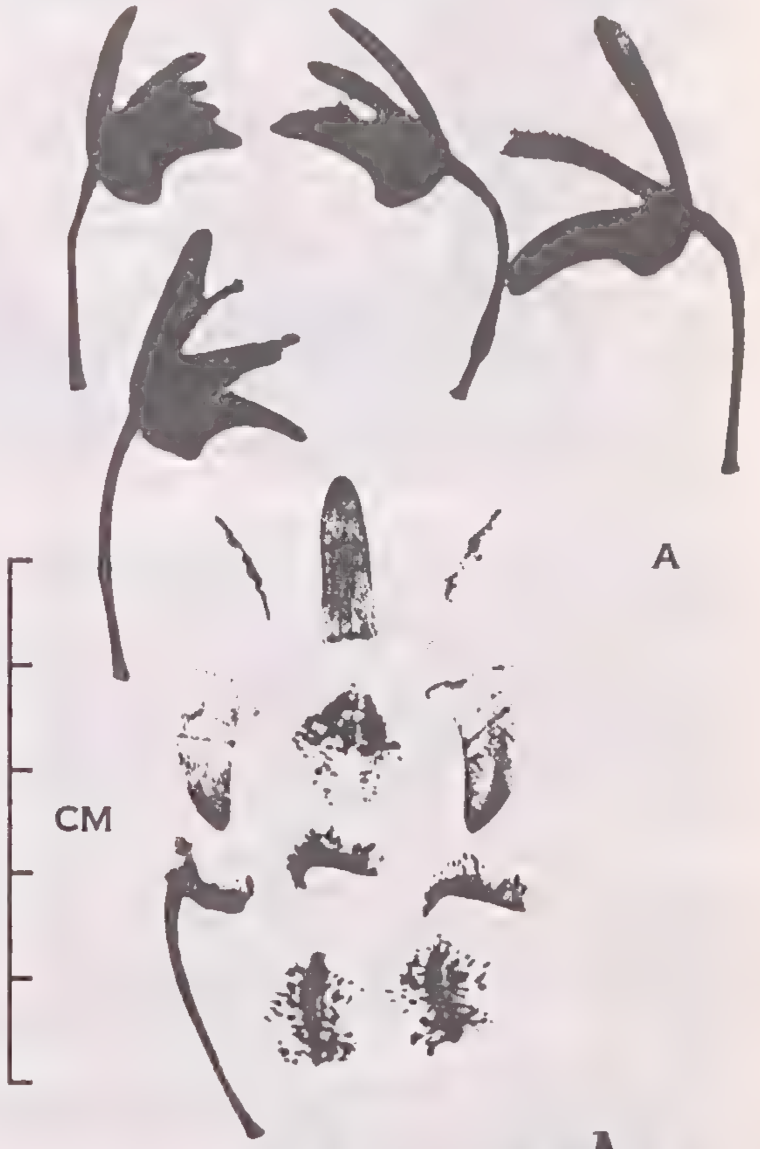
FIG. 15: *Dendrobium speciosum* Sm. var. *pedunculatum* S.C. Clemesha.

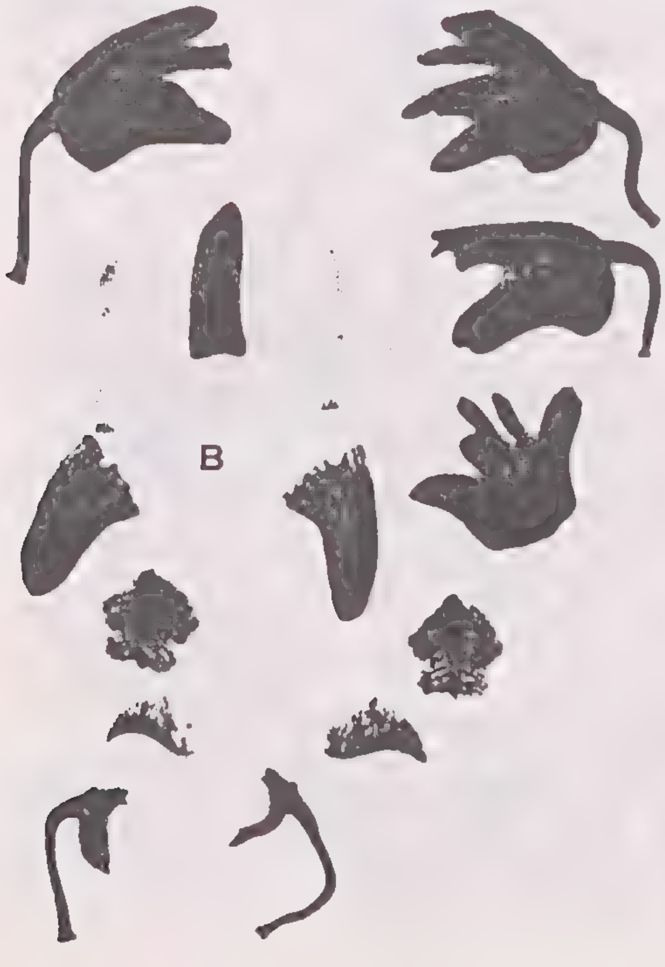
A. Specimens from the Herberton Range.

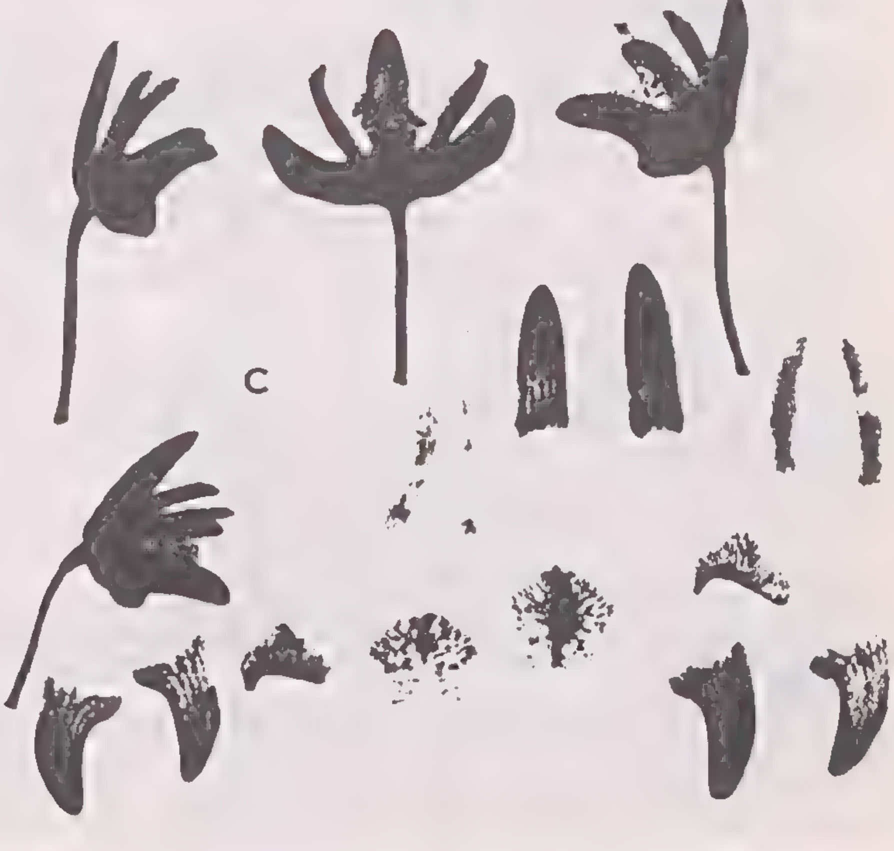
B. Specimens from a dry, rocky hill near Atherton (the Type locality).

C. Specimens from the Owen Stanley Ranges (Kokoda Trail) in Papua New Guinea.

(All specimens prepared by S.C. Clemesha from plants in cultivation.)







with very short broad segments and the *labellum* large in proportion to the tepals.

Type:

From a plant cultivated at Coffs Harbour by S.C. Clemesha, 26th August, 1980. From a plant collected by Mr Bruce Gray at Bones Knob via Atherton where it grew on an exposed rockface in full sun.

The Holotype is at the Queensland Herbarium, Brisbane and an Isotype specimen is at the N.S.W. National Herbarium in Sydney.

Distinguishing Features:

This variety differs from the others as follows: — The stems are conical and dwarf — from 5 to 16cm high but mostly about 7cm. The leaves are very stiff and rigid though often thinner in texture than other varieties.

The racemes are erect and held up by a very stiff and rigid peduncle which varies from as long to twice as long as the rhachis.

This variety is most closely related to var. *curvicaule* but it differs from it as follows: Its stems are much shorter, straight and more heavily pigmented. The peduncle is much longer and more rigid and darker. The flowers vary somewhat in shape but generally have even shorter and broader segments than var. *curvicaule.* They are a cream or a light dull yellow. The labellum is large in proportion to the other tepals.

The stems, peduncle, rhachis and even the buds — and occasionally the sepals — are stained with dark pigment. Seed capsules of var. *curvicaule* are green, whereas those of var. *pedunculatum* are dark purple.

The habitat of var. *pedunculatum* is much drier than that of var. *curvicaule* and within their natural habitats var. *pedunculatum* flowers 4 to 6 weeks earlier than var. *curvicaule.* Intermediates between the two varieties are unknown. Artificial hybrids between var. *pedunculatum* and var. *speciosum* have retained the dwarf habit of the former.

The texture of the flowers varies greatly. The Type plant's flowers were only of average texture for the species but the flowers on a plant from the Herberton Range were much thicker in texture though not as much so as the central Queensland dwarf plant of var. *grandiflorum.*

I have studied cultivated plants of this variety from the Herberton Range and Type locality and others from unknown localities.

I would like to extend my thanks to Mr Bruce Gray of Atherton who has given me much information about this variety, including its distribution.

Distribution:

This variety is found from the Palmer River in the north to the Herbert River at least in the south and mostly on the western side of the dividing range.

The name *"pedunculatum"* refers to the very long and rigid flower stalk possessed by this variety. In the past it generally has been called "var. *compactum*" but this name is a *nomen nudum* and should no longer be used. It has been applied to small examples of all other varieties. Var. *pedunculatum* when in flower is not compact.

New Guinea Specimen:

Only one plant of *D. speciosum* has ever been reported to have been collected from New Guinea and that was by Mr W. Houton who told me he found it on the Kokoda Trail at about 1,000m growing on a cliff face in strong sunlight with *D. discolor* (or a species like it). Mr Houton in a personal conversation told me that *D. speciosum* was plentiful there and he sent a plant to his home and has it still. It was collected during World War II. The plant has grown well over the years and it is in a clay pan in full sunlight. The stems are short and thick, mostly below 15cm tall and those at the edge of the pot are strongly curved.

The leaves are very thick, short and pointed and unlike any Australian plant I have seen, are a very light shade of green.

The raceme I have seen was less erect than in the Queensland plants but like them it was rather rigid, dark coloured and the peduncle was as long as the rhachis. The tepals were not as broad or widely opening as the plants from the Type locality but they differ very little from the Herberton Range plants. They were exactly the same colour. All flower segments are slightly smaller but the piece of the plant I flowered was not well established.

Since this plant differs from Australian plants only in habit, I can only regard it as a representative of a remarkably disjunct population of var. *pedunculatum.*

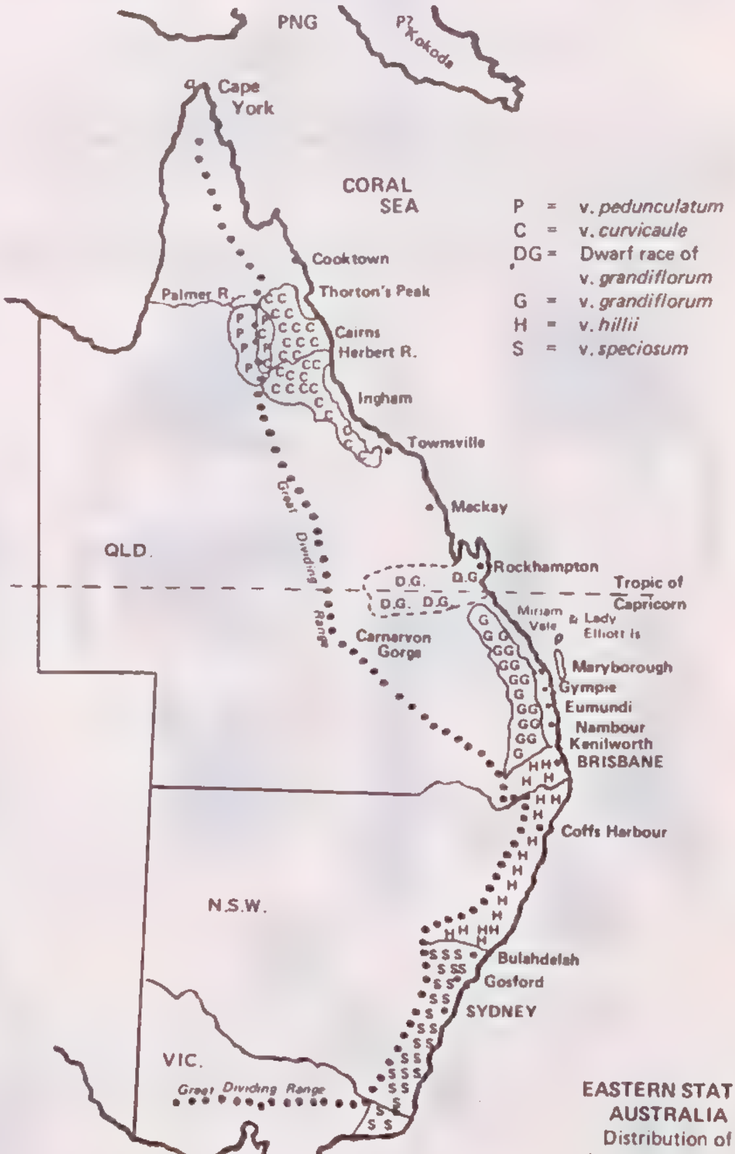
ACKNOWLEDGEMENTS:

Many people have helped in one way or another and I should like to express my thanks to Mr L. Butt, Mrs L. Cowan, Mr W. Dickfos, Mr R. Ebner, Mr B. Hayes, Mr W. Houton, Mrs N. Merritt, Mr A. Richards, Mrs G. Parker, Mr J. Soley and Mr W. Upton.

I should like also to express particular thanks to the following people who have helped me greatly, providing much valuable material and information: Mr N.A. Anderson, Mr B. Gray, Mr H. Klose and Mr & Mrs M. Krueger.

I should also like to thank Mr D. Blaxell of the New South Wales National Herbarium, Dr R.W. Johnson and the staff of the Queensland Herbarium and Mr J. Wood of Kew for sending me photographs of Type specimens and copies of early publications. I also express my thanks to Mr J.J. Betts for preparing the latin descriptions of *D. x gracilosum* and *D. speciosum* var. *pedunculatum.*

c/- Post Office
26 January, 1981 Moonee Beach, N.S.W. 2450

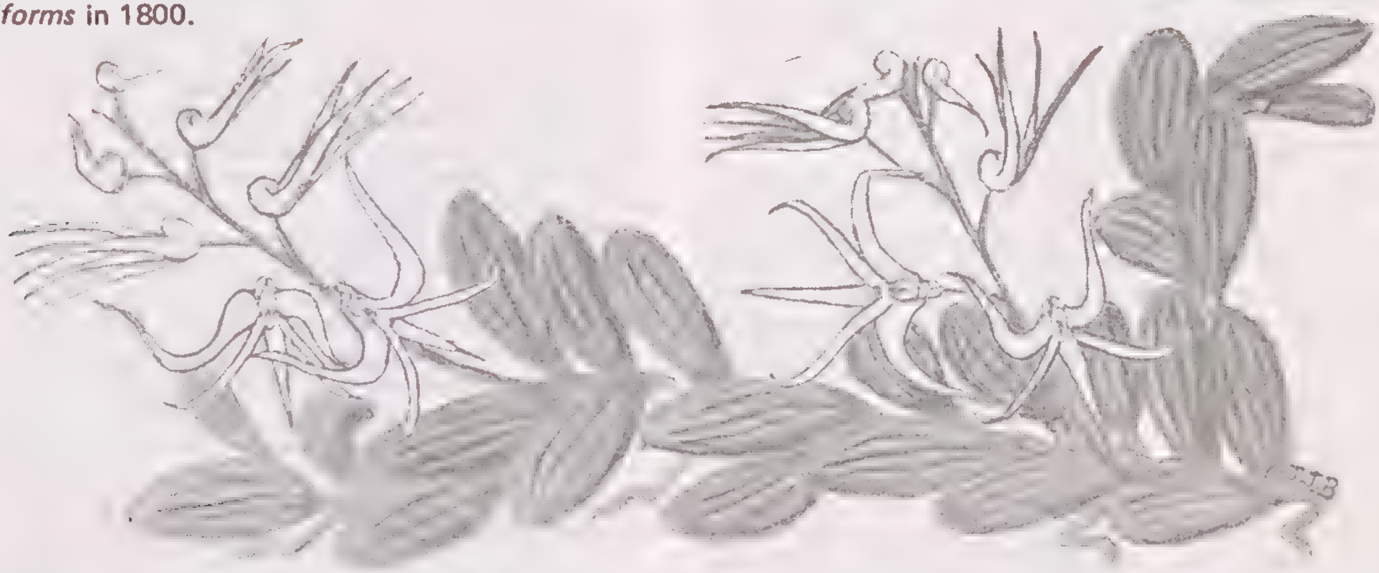


EASTERN STATES
AUSTRALIA
Distribution of
varieties – *D. speciosum*

SOME THOUGHTS ON *DENDROBIUM LINGUIFORME* Sw.

by Ted Gregory

I would like you all to share a few minutes with me in appreciation of *Dendrobium linguiforme,* surely one of our most overlooked, maltreated and generally ignored orchids. No doubt that is a rather sweeping statement to start an article with; but on top of that I must add that it is also one of our natives that Man is doing his best to exterminate from most of its habitats as well. Anyhow, more of this later on; and so let's begin at the beginning by saying this is the species upon which the genus *Dendrobium* was founded by Olof Swartz, the German botanist who described *D. linguiforms* in 1800.



As far as I can gather, this would have been just about the first Australian orchid to have been noticed by the white man, as I believe *D. linguiforme* grew in profusion on the sandstone ledges of the Rocks area of Sydney Cove in Port Jackson, the cradle of white civilization in this country. One can only guess what the early settlers thought of this fantastic plant, especially in the flowering season; or was it just another curio of a curious continent?

D. linguiforme has a very wide range of habitats, reaching south almost to the Victorian border and north almost to the top of Queensland, and inland to The Divide for most of this distance. For the benefit of our overseas readers: by "The Divide" I mean our Great Dividing Range, which more or less parallels the eastern coast of this contiment. As you know, this area contains a huge range of environments, from zero altitude on the seashore and the coastal plain and swamps, up to at least a thousand metres. As this orchid is equally happy as an epiphyte or as a lithophyte, this further increases its range within this area.

These next couple of paragraphs may apply more to the Hastings-Manning area of N.S.W. as this is the only part of *D. linguiforme's* scope that I am really familiar with, but I think the comments would apply generally to most of its range. Here *D. linguiforme* existed in incredible manner on the Swamp Oaks that abounded along the coastal lowlands and also on the Prickly Titrees that once were thick along the low ridges that were normally a little further inland than the estuarine habitat of the Swamp Oaks. *D. linguiforme* would occur at times on more or less anything in these areas; but to my knowledge the two aforementioned hosts were preferred. As one went inland and started to ascend the ranges, *D. linguiforme* still showed a preference for the *casuarina* type of host: the River Oaks along the rivers and the Mountain Oaks on the ridges. But it also was very fond of those Myrtle ridges of the foothills of The Divide. This is not to the exclusion of other hosts as *D. linguiforme* would grow on almost any tree that would hold its bark.

As I said earlier, *D. linguiforme* is equally happy growing on rocks and occurs throughout this area on any rock that meets its requirements; that is usually some growth of mosses, a suitable aspect and some chance of slight water retentiom. The outstanding feature of *D. linguiforme* as a plant is of course the rounded, flattened shape of the leaves, which are normally about the shape of a human thumbnail, but about twice as big. Hence the common name "thumbnail orchid" in N.S.W. The Queensland common name of "tick orchid" is equally appropriate and descriptive. There is a fairly wide variation in this leaf shape, from the typical almost-round shape, through oval to almost rectangular in some clones, where these leaves may be almost as long as an average sized thumb. As with most of our dendrobiums, the thickness of the leaves depends to a great extent on the season the plant has been experiencing. In a drought, when moisture is scarce the leaves may be only two or three mm. thick as the plant builds up its reserves for the next bad season.

To digress for a moment: as anyone from the land knows, as surely as night follows day droughts and bad times occur regularly all over Australia; and it is one of the outstanding features of our dendrobiums that they have learned to survive without a drink for up to six months or more at a time.

On some clones the rhizome is so short as to be almost invisible unless one goes prodding between the leaves. On others the habit is just the opposite, with the leaves strung out like a string of beads. In my experience the coastal types are more inclined to be bunchy on the rhizome, and their relations of harsher climes are more inclined to sprawl. Here is further evidence of adaptation for survival; the sprawling habit allows the plant to reach a few more drops of that precious moisture when it becomes available.

The roots of *D. linguiforme* are typical of our dendrobiums; pale of colour and capable of reaching up to a metre from the rhizome in search of nutriment.

And last but not least, this plant's downfall is its flowers. I say downfall for the simple reason that this plant is normally so well camouflaged as to pass unnoticed, but only until that beautiful white mantle comes on show. Normally these flowers are a glistenimg white, star-shaped and from two to four cm. in diameter, with most of them around the two cm. mark. They are usually carried on an upright spike which can be up to fifteen cm. long.

Individually the flowers are nothing "out of this world", but this orchid has the ability to throw up a spectacular mass of bloom which can give a beautiful halo effect, especially if the clone happens to be on a swamp oak which has almost black bark. As you may guess, this is where the halo effect really comes into its own, with black against white, and you can't get much more contrast than this. The blooms are reasonably long-lasting too, up to a fortnight being quite usual, and lasting longer if the flowering season is cool. Flowering can occur at any time from late August to late October, depending on the clone and the area. I have found over the years that the clones will retain their different flowering times in captivity: I have some clones that are finished for two months before their neighbours show a flower.

I have heard of coloured forms of *D. linguiforme* but I am afraid I have never seen one myself, either in the wild or in captivity. That is not to say that they do not occur, just that they have never been proved to me. Just a bit like the "pink *D. speciosum*" rumour that used to be kicked around my old area. I would have loved to prove it wrong, but I doubt if I ever will.

I have seen some incredible plants of *D. linguiforme* in my time both on rock and tree; some on rocks many metres across, and surely ages old, and others on old ti-trees, that had over-grown and over-grown again until they were masses just layers deep. I had one plant for years that had completely overgrown a piece of ti-tree ninety cm. long and twenty five wide. It regularly threw up two thousand flowers. Like a fool I gave it away one day, but it is still being cared for and still flowers as well as ever.

Cultivation:

I have never tried to grow this orchid in a pot. *D. linguiforme* will transplant readily onto a slab of tree-fern, ti-tree pole or an aged piece of hardwood, such as an old fence paling. If well looked after it will soon cover its new host and, once it forms a tight mat on the host it will flower well.

I like to see this plant hang at least a metre and a half above the ground with good air movement and, as a personal preference, beneath sixty percent shade. This may sound like a lot of shade to some people, but I have always leaned a bit to the heavy side as far as shade is concerned, and I have never been sorry as regards growth or flowering.

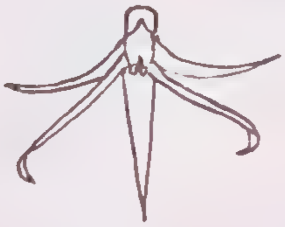
Fertilize as with all Australian native orchids, that is little and often while growth is in progress, then more or less forget it until after the next flowering.

One fact that strikes me about this orchid is that, even though it has such a wide habitat range, we have only one recognised variety apart from the type variety, to my knowledge, and as you all know, this is *D. linguiforme* variety *nugentii.* I am sorry to say I have not as yet visited north Queensland and have not seen var. *nugentii* growing in its natural habitat; but as I have been given a few plants over the years I feel I could pass a few comments on it without getting shot down in flames.

The most noticeable differences that I have seen in my limited experience with this variety are in the shape of the flowers and particularly in the shape of the leaves, which are generally rounder and much thicker than those of var. *linguiforme.* The flowers on my plants are much the same size as the type variety, but much heavier in the segments which makes them a much fuller flower.

February, 1981

Oxenford Road,
Mount Tamborine,
Queensland, 4272



GROWING NATIVE DENDROBIUMS

by David Banks

Australian native orchids have been grown for years by a number of enthusiasts in a number of different ways. The following notes refer to those Dendrobiums which are members of the cool growing *Dendrocoryne* section.

I, like most people, still grow natives in good old 'bark and charcoal'. They had grown well in this mix — until the charcoal went sour, collected salts and the roots started rotting. Charcoal builds up salts whether you use fertilizer or not.

Last year I stayed with friends of ours, Reg and Dot Sheen, of Bobin (30 km north west of Taree N.S.W.). They grow everything in Mountain Oak bark (*Casuarina* spp) and pebbles, and they grow beautifully. Pebbles are used instead of charcoal for a number of reasons;

(a) They do not build up salts — which lead to root rot.
(b) They do not break down — which makes this medium reusable.
(c) They are cheaper than charcoal.
(d) They keep roots cool in summer.
(e) They keep plants firm in their pots.

The only disadvantage of pebbles as a medium is that it is heavier than charcoal. Sandstone is not used as it tends to be a 'blotter' for water and thus stays wet, rotting the roots.

The question is, then, why do we use charcoal? The main answer is that it looks good. But how often do you see epiphytic orchids growing naturally on or in charcoal? I know I have not.

In the bush *Dendrobium kingianum* commonly grows on conglomerate, a sedimentary rock made up of rounded pebbles. The roots cling to the pebbles in this case to keep the roots cool in summer. Reg and Dot are currently experimenting using pebbles only. It will be another couple of years before we see the results of this experiment.

My present mix for all my native dendrobiums (species and hybrids) is 50% pine bark (or mountain oak bark when available) and round pebbles about 6mm in diameter. I make exceptions of *D. falcorostrum* and *D. ruppianum.* I grow my plants of *D. ruppianum* on pieces of cork or hardwood. *D. falcorostrum* in the wild grows on the top branches of the Antarctic Beech trees and likes good air circulation around the plant and roots. Therefore I grow this one on slabs of cork or in slotted terracotta pots with large chunks of Mountain Oak bark.

All my natives are grown in terracotta pots which are crocked. Seedlings are in plastic pots until past the 3" pot stage. Plants are on benches 18 inches above the ground to allow for both air movement and the discouragement of slugs and snails. The only other problem is caterpillars but these are controlled with *Dipel*®. I grow my mature plants under 50% shadecloth with the seedlings (up to 3" pots) under 70% shade. I do not use fungicides. For fertilizer, I use fish emulsion, Nitrosol and Maxi-crop every week during the growing season at half strength. The fertilizers are used in turn, never mixed together in one application.

February, 1980

183 Windsor Road,
NORTHMEAD 2152

IN SEARCH OF *SCHISTOTYLUS PURPURATUS (Rupp) Dockr.*

by Mike Harrison

During a visit to Wauchope in October 1980, I set out to find *Schistotylus purpuratus,* an orchid for which I have searched previously on several occasions but never found.

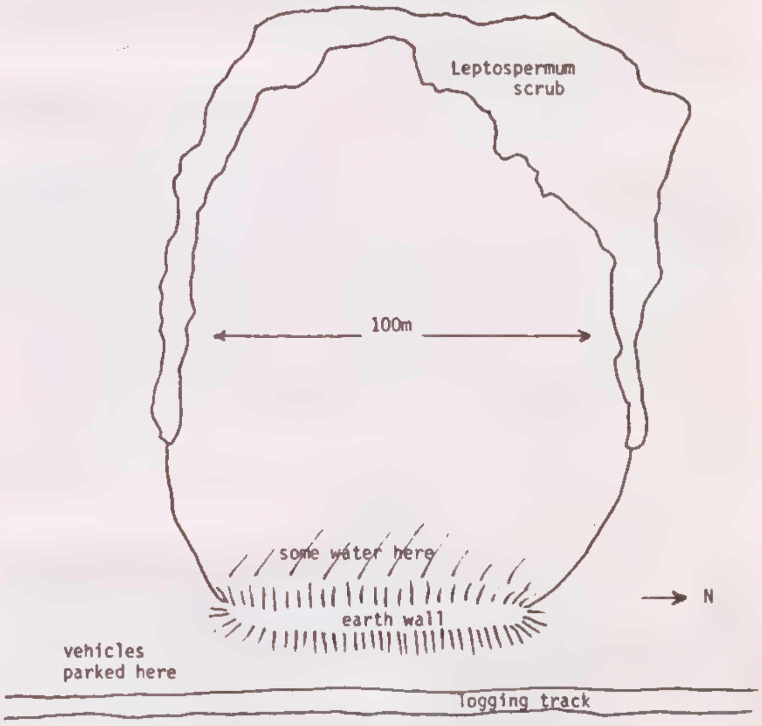
S. purpuratus is a small epiphytic orchid, one of the Sarcanthinae subtribe, and is the only member of its genus. It is usually described as being, vegetatively, very similar to *Papillilabium beckleri,* although its small purple and white flowers are quite distinct from the greenish flowers of that species. It also appears to be much less common than *P. beckleri.* Available literature gives the distribution of *S. purpuratus* as the Dorrigo Plateau, but reports have indicated that this orchid occurs in both the Hastings amd Manning areas, considerably further south than Dorrigo. But reports of its occurrence have invariably seemed sketchy and non-specific, with the orchid being mentioned only in passing, and I have often suspected that other orchids are being wrongly identified as *S. purpuratus,* and, quite possibly, vice versa.

We set out from Wauchope bright and early on the Sunday morning, our party consisting of Irwin Palmer, Norm Stockton, Garry Wells and myself, and with Errol Cook, a native of the area, as our guide. Errol and his wife Robyn, who is president of ANOS Hastings Valley Group, had told us about a spot where they had found *S. purpuratus* about eight months previously, and although Errol admits to having little knowledge of native orchids, there seems to be nothing he enjoys more than a day out in the bush, so he willingly agreed to show us the way.

We travelled west from Wauchope, along the Oxley Highway, for the first hour and a half of the journey, enjoying the magnificent scenery as we left the floor of the Hastings Valley and began our ascent to the higher altitudes of the Hastings Range and beyond. Passing Mt Seaview on our right, the mountain from which explorer John Oxley first sighted the sea during his expedition of 1818, we continued to climb, winding our way through stands of dense rainforest clinging to the mountain sides. Here the majestic Red Cedar *(Toona australis)* grows, sometimes right beside the road, its tall, spreading habit making it one of the most beautiful and elegant trees to be found in the Australian bush.

After reaching the top of the range, it wasn't long before we turned off along a logging track and headed into the bush. The forest here was open eucalyptus forest, consisting predominantly of a tree Errol called New England Ash (probably *Eucalyptus viminalis*), a tall, smooth-barked gum. A fire had been through recently, and Errol warned us that the area to which we were going may have been completely burned out. Optomist!

It wasn't too long before we reached the spot, and in all my years of orchid hunting I don't think I have ever seen a less likely looking spot to find epiphytes. It was a swampy area which appeared to have been originally formed by the construction, obviously many years ago, of an earth wall across a low lying area, presumably to provide permanent water for cattle. The dam significantly increased the water holding capacity of the area, and although it was fairly dry when we were there, I imagine that during wet weather a considerable amount of water would collect. It was, in fact, so dry when we were there that we could walk from one side of the swamp to the other, a distance of perhaps one hundred metres, without getting muddy feet, although the centre was a little soft underfoot. The margin of the swamp was thickly vegetated with a species of *Leptosperum* , a small, scrubby tree with cream flowers and prickly leaves, the tallest specimens being about six metres in height and the majority being only three to four metres. This *Leptospermum* scrub was best developed around the north-west end of the swamp (see diagram) where it formed quite a dense thicket.



So this was where *S. purpuratus* was to be found. As I climbed out of the car I felt somewhat sceptical; here we were, in the middle of hardwood forest, looking for an orchid which I had always imagined grows in cool, moist gullies, overhanging creeks. And to make matters worse, a fire had indeed recently been through and the whole area appeared charred. There was not even a likely looking host tree to be seen.

We walked in from the road and along the swamp margin until we reached the start of the Leptospermum scrub. Almost immediately we spotted orchids growing on the branches of the Leptospermums and some of them were in flower at the time. They were, much to my delight, *S. purpuratus.* The further we went, the more plants we found. They seemed to be on every tree and preferred the outermost branches and twigs, although a few were growing on the more substantial parts of the trees. The cover provided by the Leptospermum foliage was, for the most part, quite sparse, and the light intensity under which most of the plants were growing was very high. In fact, some of the plants would experience full sun for most of the day. The humidity was high, as one would expect around the margin of a swamp, and the trunks and branches of the Leptospermums were thickly encrusted with mosses and lichens, amongst which the roots of the orchids wandered freely. After inspecting the whole of the swamp margin it became apparent that the greatest concentration of orchids occurred in the Leptospermums growing along the southern border, which, because of its northerly aspect, was the hottest and sunniest area around the swamp.

In retrospect, there was one strange thing about the *Schistotylus* colony, in that only two or three mature, adult plants were seen, compared with literally hundreds of younger plants, ranging from tiny, leafless protocorms through to young adults which, although they had reached flowering size, were by no means fully grown. This lead me to speculate that the colony was only a young one and still in the process of becoming fully established. I think it quite possible, in fact, that the Leptospermums did not colonise the swamp until its permanency was assured by the construction of the dam; and, similarly, the *Schistotylus* colony was, and is, dependent upon the presence of the Leptospermums as host trees. If this is so, then here is an example of the formation of a new orchid habitat due to the activities of man; certainly a pleasant change from the norm.

Another piece of evidence suggesting the only recent evolution of this micro-environment was the absence of any other epiphytic orchid, except for one lone plant of *Plectorrhiza tridentata.* It would be interesting to visit the swamp in ten years time to see if that *Plectorrhiza* has succeeded in establishing a colony of that species alongside the *Schistotylus* colony.

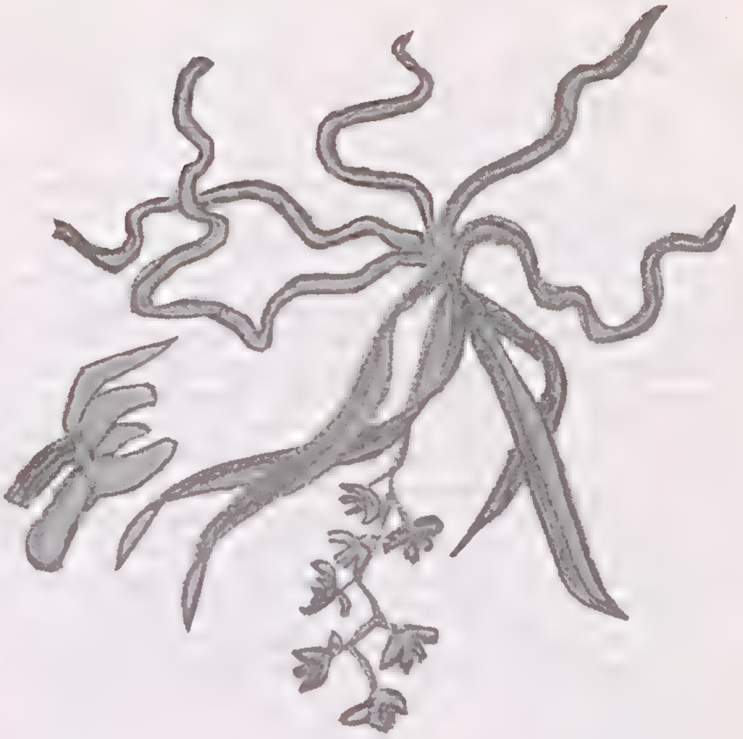
After about two hours at the swamp we returned to the vehicles and struck out again, our next destinatiom being an area of rainforest which Errol said had recently been logged, mainly for Coachwood *(Ceratopetalum apetalum).* Upon arrival, we inspected the fallen trees for some time without much luck, although we did find some plants of both *Sarcochilus falcatus* and *Dendrobium pugioniforme.* Never have I heard cicadas as loud as they were at that spot. Their sound seemed to penetrate to the very centre of my head, and conversation was made extremely difficult, if not impossible. The only relief I could obtain was to pack my ears with tissue paper — uncomfortable but better than the alternative. I ate my lunch in silence and nodded politely whenever my companions spoke in my direction.

After lunch we explored the hillside above the road, an area of dry scrub with patches of *(Trachocarpa laurina)* here and there. This was a more rewarding orchid habitat, and we found *Sarcochitus falcatus, S. hillii, Plectorrhiza tridentata, Dendrobium gracilicaule, Bulbophyllum exiguum* and a single plant of *Pteroceras spathulatus.* To my great surprise and joy we also found three further plants of *Schistotylus purpuratus.* They were quite widely separated and each grew on a different host, none of which I was familiar with, although in each case the plants were in fairly heavy shade. They were adult plants and they differed from those we had found earlier at the swamp in several aspects. Whereas the swamp plants had thick, channelled leaves heavily spotted and blotched with purple, these newer plants exhibited leaves which were not nearly so robust and the purple spotting was considerably less. Also, these newer plants had a horizontal growth habit, whereas the plants from the swamp had a more or less erect habit. It is probable that these differences are entirely due to the different habitats but it would be interesting to compare the flowers to see if any floral differences exist. This was impossible at the time as none of the plants from the new area were in flower.

Our next port of call was a rocky hilltop area where we explored a colony of *Dendrobium kingianum.* Norm, our resident mountain goat and "Kingie" fanatic, inspected each clone, even the most inaccessable, in the hope of finding another "Corrigan's Red" or "Tungsted's Pink", but they came back disappointed. The *D. kingianum* here was not a particularly good one, with an untidy growth habit and only average flowers. Still, it was lovely to see a rock face covered with it. I looked for *Sarcochilus ceciliae* but couldn't find it, although the terrain was the kind this orchid prefers, with cliffs and crevices, and large moss covered boulders. Garry turned up an interesting plant. It was a *Plectorrhiza tridentata,* but somewhat unusual. It was a robust, single stemmed plant, growing erect on the dead stem of an Everlasting Daisy only a couple of centimetres above ground level. Because of its habit and size, Garry suggested that it might be *P. erecta,* the Lord Howe Island species, which he has seen growing in exactly that way on Lord Howe Island. But after examining the flowers we agreed that they looked too much like *P. tridentata* to be anything but that species.

Our last stop for the day was a shady gully right beside the road on the way back to Wauchope. Here we found an interesting assortment of Sarcanthinae species, including *Sarcochilus olivaceus, S. falcatus, S. hillii, Plectorrhiza tridentata* and *Papillilabium beckleri* in an area no larger than an average suburban back-yard. But the predominant orchid here was *Pteroceras spathulatus.* Several dozen plants, ranging from seedlings through to very large adult plants, made up the colony, and both the green and brown flowerimg forms were present. As is their habit, they were growing on the outermost twigs of the host trees, in this case *Backhousia myrtifolia,* and many of the larger plants were hanging in mid-air, attached by only one or two roots. This happens, of course, when the twig on which the plant originally germinated and grew, dies, and either rots out or drops away from the roots. This process usually takes some time to occur, and during that time the plant invariably sends out aerial roots which attach to other parts of the host, thus saving the plant from falling to the ground and dying.

Schistotylus purpuratus (Rupp) Dockrill.
Drawing J. J. Betts.



I arrived back in Wauchope that evening tired but victorious; I had found *Schistotylus purpuratus* at last, and in two separate and distinctly different locations. Contrary to previous descriptions, the plants I had seen were not "almost identical, vegetatively, to *Papillilabium beckleri*" and were relatively quite distinct from that species. Their fleshy, spotted leaves were not as broad as the leaves of *P. beckleri,* and were actually quite reminiscent of *Sarcochilus hillii,* although the spotted areas were not raised and warty as they are in *S. hillii* and *S. ceciliae.*

Grown on small pieces of sawn, natural cork, this orchid appears to grow well and produce new leaves and new roots fairly quickly. In cultivation, however, the new leaves are completely unspotted and are a clear mid-green in colour. This would suggest that the leaf spotting in nature is an environmental characteristic and may be caused by exposure to strong light. Plants that I am growing at home are under quite heavy shade. Another possible explanation is that the spotting is caused by wasps, as has been suggested was the cause of the leaf spotting on the enigmatic *Sarcochilus harriganae,* and may be the cause of the leaf spotting invariably found on *Pteroceras spathulatus,* a characteristic of that species which also tends to disappear in cultivation.

Finally, my thanks to Robyn and Errol Cook of Wauchope, without whose hospitality my trip would have been considerably less enjoyable and successful.

Lot 2, Howes Road,
February, 1981 East Kurrajong Via Wilberforce. 2756

Who's Who

THE AUSTRALASIAN NATIVE ORCHID SOCIETY OFFICERS AND GROUP CONTACTS:

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President: J.A. Walker; Vice-President: E. Gordon; Secretary: D. de Silva; Asst. Secretary: Nola Martin; Treasurer: E. Husted; Editor: J.J. Betts; Asst. Editor: P. Weston; Councillors: M. Harrison, F. Martin, F. Pierce, G. Wells.

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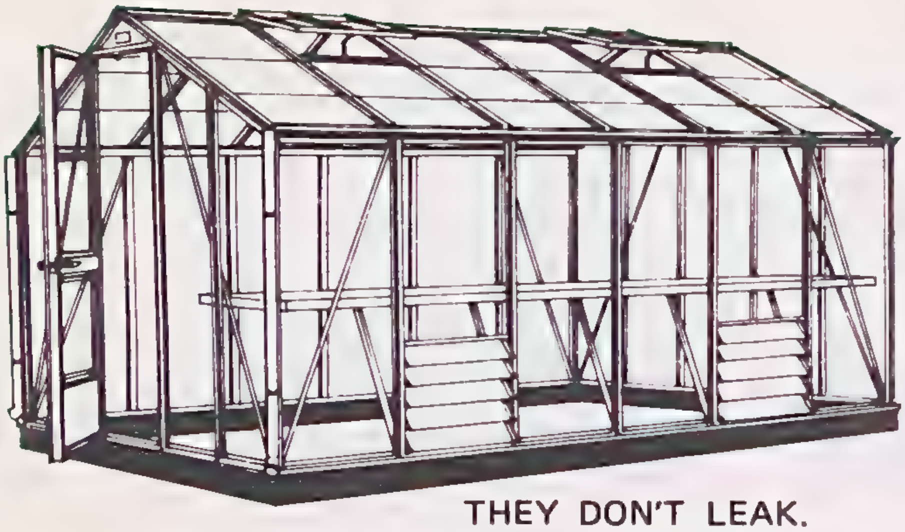BACO BUILDS BETTER GLASSHOUSES

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Dendrobium X gracilosum (syn. X gracillimum) *

JUNE, 1981

Vol. 6, No. 12 *Registered for posting as a publication — Category B.* *Price: $2.00*

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Articles should be typed in duplicate preferably on A4 size paper; double spaced with 4cm or more left-hand margins.

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- Others are listed by States inside the back cover.
- Societies may affiliate by subscribing to *The Orchadian* — which includes membership of A.N.O.S.

Date this issue distributed:
25th June, 1981

THE COVER DESIGN *

For the first time, our cover design depicts a man-made hybrid. The name is perhaps controversial in that the parent species used by P. Collin in making this hybrid were *D. gracilicaule* var. *howeanum* and *D. speciosum* var. *speciosum* rather than the recognised parents (var. *gracilicaule* and var. *hillii*) of the natural hybrid formerly known as *D. X gracillimum.* Further botanical studies could separate the Lord Howe Island species from the Australian mainland plants of *D. gracilicaule.* Meanwhile the proper name must be *D. X gracilosum.* Drawn from the Editor's plant which carries larger, more open flowers than the natural hybrids.

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- Fertilisers for native orchids.
- *Vanda* species common to Australia and Papua New Guinea.
- A new subspecies of *Pterostylis* for north Queensland.
- Ted Gregory on *Dendrobium tetragonum.*

MEMBERSHIP RENEWAL: Subscription notices for the year July, 1981 to June, 1982 are enclosed with this issue. If you have not already sent your cheque, please remit $10.00 together with the renewal notice to ANOS, c/- B. & C. Mailing Service Pty. Ltd. without delay. The September issue will not be posted to members who have not renewed by the date of issue.

BACK ISSUES of *The Orchadian:*
See details on back cover of this issue.

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THE ORCHADIAN

Founded August, 1963

Editor: J.J. Betts
Honorary Associate Editors: Dr N.J. Grundon (Qld.), Mr J. Simmons (S.A.)

Volume 6 June, 1981 No. 12

EDITORIAL

After the gentle warning in my editorial of March, 1981 about escalating costs I must now confirm the bad news: Subscriptions must rise to $10 from 1 July, 1981. The good news is that ANOS Council believes that this increase taken along with the steady increase in membership (now over 900) will enable *The Orchadian* to maintain its standards for the new volume which begins with the September issue. An index for Volume 6 will supplement that issue. To secure our future now we ask all subscribers to renew their subscriptions urgently and also to act upon my plea that everyone should try to enlist at least one new subscriber for the year 1981-1982. If both these things are achieved we should not only defer increasing subscriptions in future but also perhaps expand and improve an already good journal.

In the past we have delayed cancelling membership for non-payment of subscriptions in the first quarter of our financial year (knowing that some of our staunchest supporters can be absent-minded at renewal time). Unfortunately we cannot afford to continue this benevolent line and send out reminders; so we shall NOT mail the September issue and index to those who have failed to renew before the distribution date in September. We do hope this June issue will not be your last. Why not send your cheque now to the Hon. Treasurer and enclose with it a note to the Editor on what you would like — or not like — to see in the new volume?

Reviewing the three years of Volume 6, concluding with this issue, the space given to articles on cultivation and habitats has been limited by that required for important botanical and taxonomic material. In particular there has been an extraordinary flow of descriptions of new species for both Australia and Papua New Guinea — but especially for the latter. In view of the orchid-richness of PNG this is not surprising and it is fortunate for *The Orchadian* because its publishing of so much that is new to the orchid world is making our journal "required reading" for serious orchidologists throughout the world. There is every indication that this will continue as long as *The Orchadian* maintains its standards as an authoritative orchid journal.

Nevertheless our greatest challenge in future years will be to increase the proportion of material on horticultural methods, hybridisation and improvement of the species by line breeding. Botanists have been our most prolific contributors to Volume 6 — perhaps because their work is based on painstaking careful studies which enable them to use well defined guidelines and techniques of writing. On the other hand amateur growers have an insatiable appetite for information on how to grow orchids — even when they are very experienced and have read it all before. They make up the greater number of our readers; but it seems that authorship is not their *forte* as a general rule. To write a really inspiring article requires skill and perhaps a natural gift. The guidelines are not so well-defined — probably because successful cultivation is an art rather than a science. In any case, for Volume 7 we are looking for more "culture" from the many orchid growers who have not yet used their latent skills as writers.

FEEDBACK & FOLLOW-UP

- Dr P.J. Cribb's "Preliminary Key to *Dendrobium* section *Latouria* (at page 277 this issue) will be the basis for his full revision of the section to be published in due course at Kew. Would readers please note the request, in Dr Cribb's introduction, for any critical comments that would assist him in completing the full revision.
- **Checklist of Australian Native Orchid Hybrids** — ANOS plans to issue a revised edition of the Checklist as soon as possible. The forthcoming second edition will include every Australian native hybrid ever registered and will be up-to-date at the end of June, 1981. It will be an essential handy reference and guide to all those interested in breeding native hybrids and naming new ones. The first edition, published in December, 1977 has been sold out and it is hoped that the new edition will be available in time for the Seventh Annual Spring Show (Sydney and Warringah ANOS Groups) at Mona Vale Memorial Hall on 12 & 13 September, 1981. Advance orders may be sent to The Secretary, ANOS, for $1.50 per copy (incl. postage).

THE 13TH INTERNATIONAL BOTANICAL CONGRESS ORCHID SYMPOSIUM, AUGUST 1981

The Orchid Society of N.S.W. has organised an Orchid Symposium as a satellite meeting of the International Botanical Congress in Sydney in 1981. The Congress itself will be the first to be held in the southern hemisphere and the opportunity has been taken to enlist some of the world's top orchid scientists attending the Congress to take part in the Orchid Symposium at the University of Sydney(Stephen Roberts Theatre) on Saturday, 29th August and Sunday, 30th August, 1981, 9 a.m. to 9 p.m. on each day.

This is indeed a once-in-a-lifetime opportunity for orchid enthusiasts, both amateur and scientist, to hear from such a gathering of international experts. Among them are Prof J. Arditti (USA), Prof R.E. Holttum (U.K.), Prof A.N. Rao (Singapore), Dr R.L. Dressler (Panama), as well as Australian scientists such as Dr A.S. George (W.A.), Dr P.S. Lavarack (Qld.), Dr J.H. Warcup (S.A.), Don Blaxell (N.S.W.) and Mark Clements (A.C.T.).

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REVIEW OF *DENDROBIUM SPECIOSUM* Sm. – CONCLUDED

The comprehensive review published by S.C. Clemesha in our last issue (Vol. 6, No. 11) has already drawn both critical and favourable comments from a number of quarters. See "Letters to the Editor" and related comments by Mr Clemesha on page 273. In the article below, the author completes his review after studying photographs of the Type specimen of **D. speciosum** *var.* **bancroftianum** *which subsequently came to hand from Vienna via Kew. It is suggested that the two articles be read in conjunction.*

Readers should note that the map showing distribution of varieties of **D. speciosum** *(at p. 262) contains an error in drafting: the boundary line for var.* **curvicaule** *should extend south to "near Mackay" at least, as indicated in the article. Being responsible for this error I should appreciate it if readers would amend their copies of the map with a line extending to the coast south of Mackay.*

– EDITOR

Dendrobium speciosum Sm. var. *bancroftianum* Reichb.f.

by S.C. Clemesha

Summary:

The purpose of this paper is to establish the identity of *D. speciosum* Sm. var. *bancroftianum* Reichb.f. and to reduce it to a synonym of *D. x gracilosum* S.C. Clemesha. Some history of the variety is given.

D. speciosum Sm. var. *bancroftianum* Reichb.f., Gard. Chron. 15 (1881) 782. In *The Orchadian* Vol. 6, No. 11, p. 247 (March, 1981) I published "A Review of *Dendrobium speciosum*" which contains references and additional information. In that review I did not include *D. speciosum* var. *bancroftianum* because I had not seen the Type specimen or a photograph of it.

Mr J. Wood of the Royal Botanic Gardens, Kew, very kindly has obtained two photographs of the Type sheet of var. *bancroftianum* through a colleague of his who visited the Natural History Museum at Vienna, Austria, where the Type of this variety is held. I am very grateful to Mr Wood for arranging this for me. The photographs are shown here.

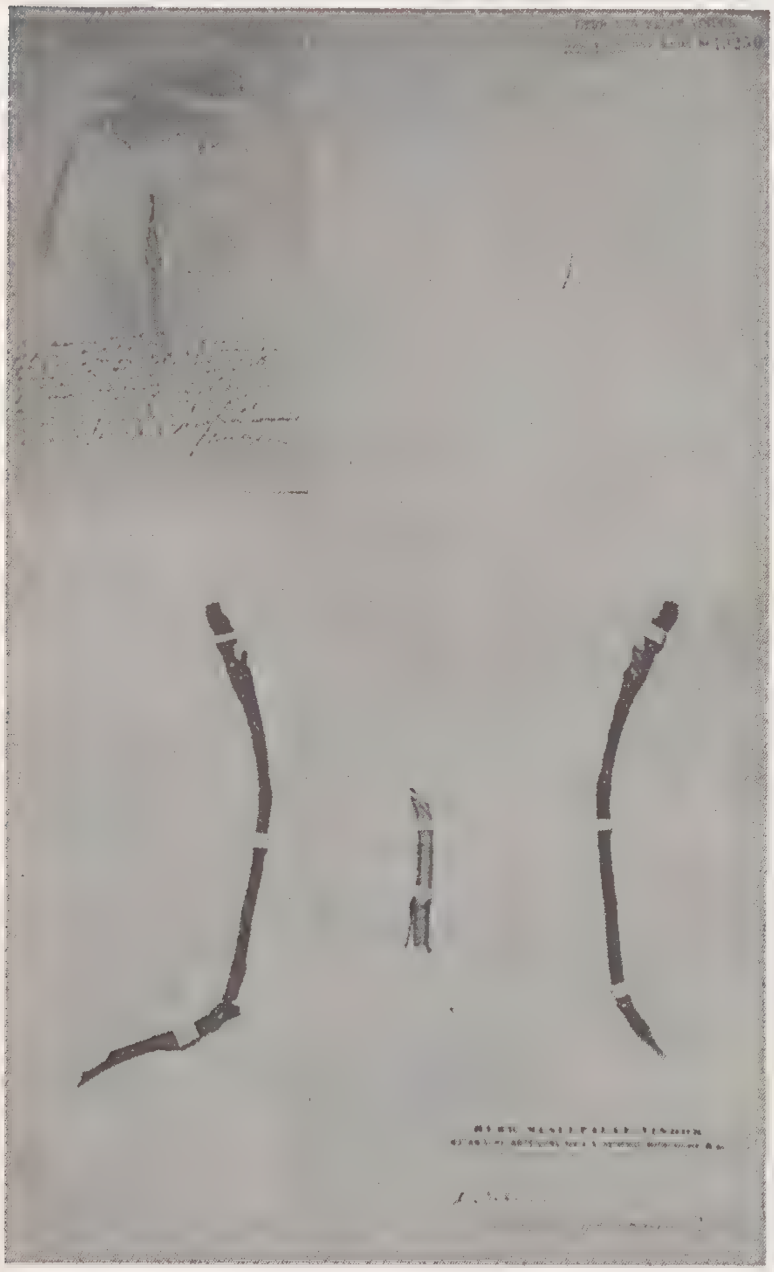


FIG. 1: *D. speciosum* var. *bancroftianum* Type specimen.

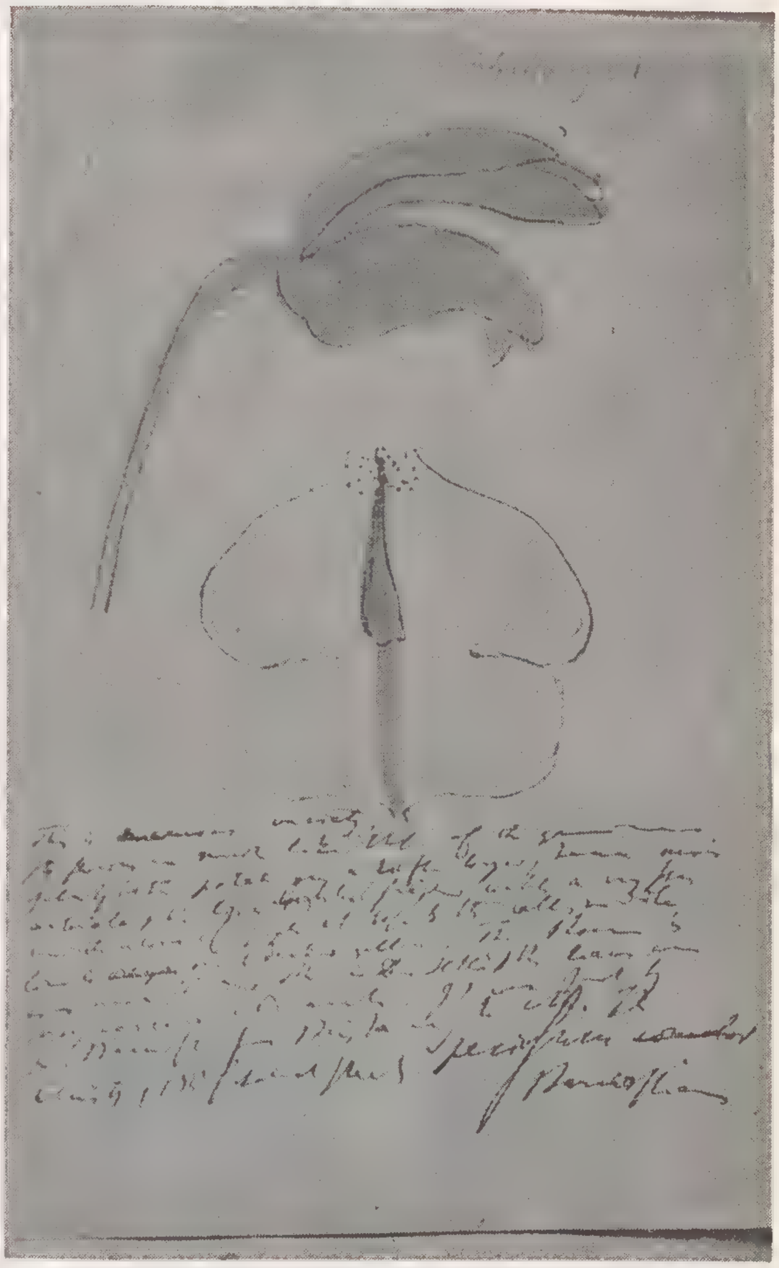


FIG. 2: *D. speciosum* var. *bancroftianum* drawing on Type sheet.

It can be seen from these photographs that only three sections of stem, which lack bases (fig. 1) and a water-coloured line drawing (fig. 2) are present. The handwriting on the drawing reads as follows:

"This is distinctive variety. Its flowers are much like those of the genuine plant but the petals are a trifle longer hence more antennate and the tip is lightest sulphur with a very few minute atoms of purple at (base) and the callus at the base is (orange) and darker yellow. The stem is even more slender than is D. Hillii HK. Leaves are very narrow in width.

It was sent by Dr Bancroft from Brisbane to Mr T. Christy his friend. Den speciosum (concolor) Bancroftianum."

Note: The words in brackets were difficult to read and they warrant the following comments:

The word interpreted as "base" appears more like "top" — perhaps referring to the top of Reichenbach's drawing of the labellum.

The word "orange" appears to be scored out but may be underlined. There are two tones of colouration in the drawing.

The word "concolor" is definitely scored out and replaced by "Bancroftianum" written below it.

Perhaps the main evidence that this is the Type specimen sheet is the close similarity between the handwritten notes and the description published by Reichb.f. in Gard. Chron. 15 (1881) 782 (see *The Orchadian* Vol. 6, No. 11, p. 257).

Below the stems the determination of *D. speciosum* is question-marked presumably by Reichenbach.

Stems:

Though no scale is present it is evident that the stems are very narrow compared to the width of the sheet. They are a good match for stems of *D. x gracilosum* (see other photographs of this hybrid in *The Orchadian* 6, 11 l.c.). Reichenbach's published description states ". . . the stem is even more slender than that of *Dendrobium hillii,* Hook. and that alone affords a good mark for distinction". That is true of *D. x gracilosum* compared to *D. speciosum* var. *hillii* Masters.

The drawing also matches *D. x gracilosum* in the following points.

Floral Spur:

In *D. x delicatum* the base of the sepals, column and labellum form a spur which curves downwards. In *D. x gracilosum* this often is present to a lesser degree but frequently it is absent. This is the case in Reichenbach's drawing.

Sepals and Petals:

The rather short, broad lateral sepals depicted are a characteristic of *D. x gracilosum.* They are quite different from those of *D. speciosum* var. *hillii.* In that plant they are long and narrow. The apices of the sepals and petals in the drawing are blunt as are those of *D. x gracilosum.* In *D. x delicatum* the sepal and petal apices are more pointed.

Labellum:

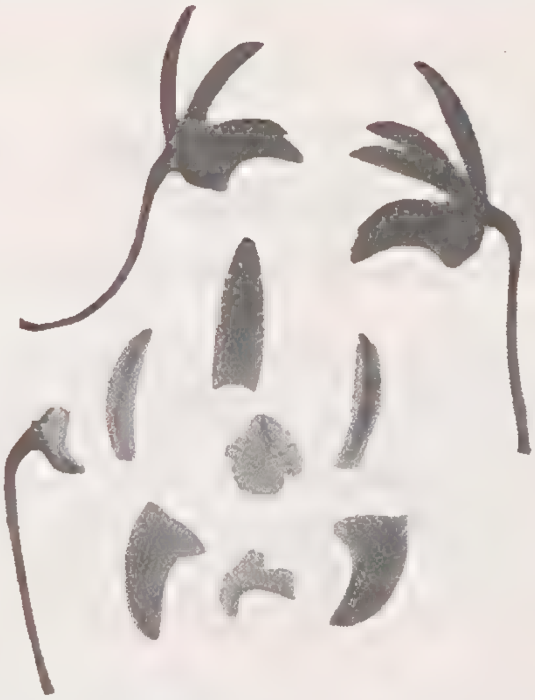
The labellum of *D. x delicatum* has a short, narrow basal portion. *D. x gracilosum* lacks this and so does Reichenbach's drawing. The particular labellum illustrated lacks markings except at the base.

D. speciosum var. *bancroftianum* was published earlier than var. *nitidum* F.M. Bail. and var. *gracillimum* Rupp. All represent the same taxon so the first-mentioned is the legitimate name for it in varietal rank. Artificially produced hybrids approach the naturally occurring population in most respects, supporting the conclusion that the taxon under discussion is a natural hybrid between *D. speciosum* and *D. gracilicaule* F. Muell. This is evident also because it is intermediate between the two species in its parts.

***D. x gracilosum* S.C. Clemesha is the only legitimate name for this hybrid in species rank, so *D. speciosum* var. *bancroftianum* and *D. speciosum* var. *hillii* forma *bancroftianum* (Reichb.f.) F.M. Bail should now be regarded as synonyms of it.**

FIG. 3:

D. x gracilosum S.C. Clemesha. Pressed flowers from a plant found at Dungog, New South Wales (1980).



Historical Aspects:

The var. *bancroftianum* has not been well understood in the one hundred years since it was first published. The original description contains an apparent error. That is ". . . the petals are a trifle longer . . ." (Reichenbach was making a comparison with var. *speciosum*). F.M. Bailey's descriptions of var. *bancroftianum* in Bot. Bull. 14, (1896) and Qld. Flora, 5 (1902) 1526 have another apparent error. That is "stems with the robust habit of *D. speciosum* var. *hillii*".

Kränzlin, *Pflanz. Heft* 45 (1910) 270-271, identified var. *bancroftianum* with *D. x delicatum.* This is not surprising in view of the similarity between *D. X delicatum* and *D. x gracilosum.* It is likely that Kränzlin did not see the Type material since Reichenbach died in 1889. In his will he left his herbarium specimens to the Natural History Museum at Vienna on the condition that the sealed boxes not be opened for twenty-five years. This condition was kept so if Kränzlin saw the specimen it must have been before Reichenbach's death.

Rupp and Hunt, in *Proc. Linn. Soc. N.S.W.* Vol. 72, p. 6 (1948), rejected Kränzlin's conclusion because of Bailey's description of the stems and long, narrow sepals and petals.

D. x gracilosum and *D. x delicatum* can be difficult to distinguish from limited material. That is why the distinguishing features of *D. x gracilosum* shown on Reichenbach's Type sheet are pointed out here.

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SPRING SHOW DATES

5 September, 1981:
ANOS Central Coast Group — a competitive one-day show — at the Scout Hall, Gertrude Place, East Gosford. Judging will be done by accredited ANOS judges. The Secretary's telephone number is (043) 88 1785 (Mrs Dellas Johnston).

11 — 13 September, 1981:
ANOS Seventh Annual Spring Show at Mona Vale (Sydney and Warringah ANOS Groups). See show schedule distributed with the June issue of *The Orchadian.*

10 October, 1981:
Hastings Valley ANOS Group — Spring Show to be held at Wauchope. See earlier notice in *The Orchadian* for March 1981, p. 246.

LETTERS TO THE EDITOR

Dendrobium speciosum — Distribution of Varieties.

Dear Sir,

In Steve Clemesha's recent review of *Dendrobium speciosum* (Orchadian Vol. 6, No. 11) he mentioned a recording by Rupp of *D. speciosum* var. *hillii* from Mangrove Mountain (west of Gosford, N.S.W.). I would like to mention here that Ian Slade of Peat's Ridge has a plant of *D. speciosum* var. *hillii* which originated from the Peat's Ridge basalt quarry before its habitat was destroyed by mining for the basalt. *D. speciosum* var. *hillii* can still occasionally be seen growing in the Wattagan Mountains west of Wyong.

The western hillside at the quarry site was once clothed in sub-tropical rainforest supported by rich soil derived from the basalt. Only remnants of this pocket of rainforest exist today, and few orchids can be seen. According to Ian, there was once a wide variety of orchids present, including *Dendrobium speciosum* var. *hillii, D. gracilicaule, D. x gracilosum, D. teretifolium* and *D. aemulum.* The type variety of *D. speciosum* also abounds in the region. The quarry site could possibly be the most southerly limit of *D. x gracilosum.*

Another interesting orchid reported by Ian Slade to have once grown at the Peat's Ridge quarry site was *Sarcochilus ceciliae* which was said to have grown in exposed clefts in the basalt, according to one of the early quarry workers. Other sarcanthinae included *S. falcatus* (large flowered form), *S. olivaceus, S. hillii, Plectorrhiza tridentata,* and *Papillilabium beckleri.* It is also possible then that the quarry site was the southernmost limit for *S. ceciliae* although I don't know of any specimens to confirm the report.

I remember seeing plants of *D. speciosum* growing high up on trees at Minnamurra Falls which might have been var. *hillii;* perhaps other readers could confirm this?

Steve Clemesha also mentions the occurrence of *D. speciosum* var. *curvicaule* near Mackay and so I feel that modification of the published distribution map could be made as more information comes to hand, particularly from New Guinea and far north Queensland.

Yours sincerely,
Norm Stockton
9 Agnes Avenue
Wahroonga, NSW. 2076
8 May, 1981

Comments by Steve Clemesha

Dear Sir,

Don Blaxell (pers. comm.) has told me that there are plants of *D. speciosum* in the Bunya Mountains (Qld.) that look like plants of *D. speciosum* from near Sydney.

In my treatment of var. *grandiflorum* I pointed out that var. *speciosum* and var. *grandiflorum* resemble each other closely. I also pointed out the distinguishing features between them. The two varieties are isolated from each other as var. *hillii* grows between their ranges. I am quite certain that neither var. *speciosum* nor var. *grandiflorum* are found in northern N.S.W. — north of Bullahdelah. I have examined many living and pressed specimens of var. *hillii* within northern N.S.W. both in cultivation and the wild. This is the area where I have lived for the last five years. Furthermore my opinion that only var. *hillii* is found in northern N.S.W. is supported by Ted Gregory, Harry Klose and Sandy Anderson, all of whom have had greater experience of northern N.S.W. than I have.

If any gap is found in the distribution of *D. speciosum* it is in the dry barren stretch of coast between Rockhampton and Sarina (about 30km south of Mackay). I have seen plants of *D. speciosum* growing on a volcanic plug near Rockhampton and do not know if this particular central Queensland race extends much further north. There are some low ranges in the dry region south of Sarina where it is possible that *D. speciosum* could grow. The variety *curvicaule* could possibly extend south of Sarina where sizeable ranges exist with sufficient rainfall.

Norm Stockton's letter on the orchids of the Peat's Ridge basalt quarry area is interesting — particularly the reports of *D. x gracilosum* and *Sarcochilus ceciliae* from that area. I feel that specimens of these plants from this locality should be placed in the N.S.W. National Herbarium. As Rupp (Orch. N.S.W. p. 114) states that *D. x gracillimum* "appears to be restricted to areas north of the Hawkesbury River" it is likely that he knew of plants in the Peat's Ridge area.

The report of *D. speciosum* var. *hillii* from this area also is interesting if correct. In view of the specimen recorded by Rupp (Orch. N.S.W. p. 114) from Mangrove Mountain, it seems likely that the record could be correct. I would be most interested in examining a few flowers of the plants alleged to be var. *hillii* so that the record could be confirmed. The same applies to the reported Wattagan Mountains plant of var. *hillii.* I have examined flowers from cultivated plants of *D. speciosum* var. *speciosum* from both the Peat's Ridge and Wattagan areas. This is not to say that both varieties are not found in these areas as there are herbarium specimens of the two varieties from Bullahdelah in the N.S.W. National Herbarium. Probably they are from different habitats.

With regard to the Minnamurra Falls report, I would be interested to know why Norm Stockton considers the plants from there to be var. *hillii.* The implication seems to be that it is simply because they grew high on trees.

D. speciosum var. *speciosum,* var. *hillii,* var. *grandiflorum,* var. *curvicaule* and *D. x gracilosum* (and also many other orchids) all grow on both trees and rocks but trees inhabited by *D. speciosum* seem to be confined to rainforest areas.

Mr Howard Judd, the ranger in charge of the Minnamurra Falls reserve made a very thorough list of the flora of the Minnamurra Falls reserve and *D. speciosum* var. *hillii* is not included.

As I had heard other reports of var. *hillii* in the Illawarra region, I wrote to Mr Leo Cady about it. He said he had never heard of var. *hillii* being found on the N.S.W. south coast, and the furthest south record he knew was Mangrove Mountain.

I received a division of a plant of *D. speciosum* var. *speciosum* from near Cambewarra Mountain. Prior to being collected it grew on a tree. The underside of the clump was semi-circular and bore pieces of bark. A flower pressing of this clone is shown at p. 249 (specimen D) in *The Orchadian,* Vol. 6, No. 11.

The old idea that var. *hillii* always grows on trees and that var. *speciosum* grows only on rocks is a mistaken one. I have visited three areas west of Coffs Harbour where var. *hillii* grows on rock faces in open forest. In these localities no plants grow on trees.

Yours sincerely,
Steve Clemesha
c/- Post Office
Moonee Beach, NSW. 2450
May 22, 1981

"FOSTER PARENTS" for Orchids at Spring Shows.

In the March issue of *The Orchadian* in the editorial section, it was pleasing to note that a "Plant Foster Parent" plan was considered a viable proposition.

Let us all, as readers of *The Orchadian* and lovers of Australian Native Orchids, offer our services to our colleagues in various states and put our orchids on display for all to see and admire.

A system could, at a later date, be devised amongst the various State Groups with A.N.O.S. Council collating the names, addresses and telephone numbers of the willing "Plant Foster Parents" via their respective Group Secretaries.

I offer my name and address as a prospective parent and am sure there are other willing parties. Write now and submit your name.

Erhard Husted
81 Darvall Rd., West Ryde, NSW. 2114
Tel.: (02) 85 4678
8/5/81

Two New Orchids from the Highlands of Papua New Guinea

by P.J. Cribb

Summary: Two new species of *Dendrobium* sect. *Ceratobium* from Papua New Guinea are described and their horticultural potential is briefly discussed.

In preparation for a forthcoming revision of sect. *Ceratobium* of the genus *Dendrobium* two new species, *D. magistratus* and *D. hamiferum,* from highland New Guinea are described. Both were brought to my attention by Tom Reeve of the Department of Primary Industry at Laiagam, Enga Province of Papua New Guinea and all the material at my disposal at Kew was collected by him.

Schlechter (1912) recorded *D. cochliodes* at between 850 and 1000m as growing at the highest altitude of all the species in the section known to him. The recently described *D. crispilinguum* Cribb and both the species described here grow at higher altitudes. All three species might also be profitably utilised to introduce some degree of cold tolerance to hybrid Ceratobiums as most of the parents used thus far have originated at lower altitudes often from sea level. Indeed Howcroft (pers. comm.) has already successfully used *D. crispilinguum* in a hybridisation programme.

Dendrobium magistratus Cribb sp. nov. affine *D. crispilinguo* Cribb sed floribus distincte coloratis et lobis lateralibus erosis lobo medio labelli triangulari satis differt. Typus: Papua New Guinea, **Reeve** 393 (holotypus K; isotypus LAE).

A medium-sized to large epiphytic herb. Stems canelike, clustered, many noded, tapering somewhat towards apex, dilated somewhat at base, up to 60 x 1cm, covered for most part by tubular sheaths and leaf bases, up to 15- or more leaved. Leaves distichous, coriaceous, flat, elliptic or oblong-elliptic, slightly bilobed at the rounded apex, up to 10 x 3.5cm, each with a tubular sheathing base up to 4cm long. Inflorescences several, spreading to arcuate, lateral and emerging through base of leaf-sheaths or terminal, up to 14cm long, densely few- to many-flowered; peduncle terete, much longer than rhachis, bearing three short sheaths along length; bracts narrowly triangular, acuminate, 4mm long. Flowers subnutant, borne close together spirally on rhachis; sepals, petals, ovary and pedicel creamy white; lip yellow veined with red especially on side lobes. Dorsal sepal lanceolate, acute, 2.5 x 0.6cm, with upcurved sides and a reflexed apex; mentum conical, pointing backwards, 6mm long. Petals spreading, linear, acute, 1.3 times twisted, 3.3 x 0.2cm. Lip 3-lobed in apical half, not recurved, 2.2 x 1.35cm, verrucose on lateral veins; side lobes rounded, erect, with markedly erose margins; mid lobe narrowly triangular, acuminate; callus of five longitudinal low somewhat erose lamellae, the outer two being highest. Column with rounded but erose apical margins, 3.5mm long; foot 6mm long.

Papua New Guinea: West Highlands Prov., Minj Distr., Nondugl, Kongonol, May 1980, **Reeve** 393! (K, holotype) Habitat: Epiphyte in montane areas; about 1500m.

D. magistratus is a distinctive orchid which resembles *D. crispilinguum* in flower size but is easily distinguished by its clustered flowers, distinctive flower colour and by its lip which has a small acuminate mid lobe and broad erose side lobes.

This species is named after Tom Reeve whose name and unofficial duties around Laiagam are reflected in the specific epithet.

Dendrobium hamiferum Cribb sp. nov. affine *D. crispilinguo* Cribb sed sepalis porrectis leviter incurvatis subobtusis labello parvo angustato et stelidiis columnae apicalibus acuminatis satis distinctum. Typus: Papua New Guinea, **Reeve** 400 (holotypus K; isotypus LAE).

A medium-sized epiphytic or lithophytic herb. Stems very slender, canelike, terete or slightly bilaterally compressed, somewhat dilated above, 35 to 110cm long, 0.5cm in diameter, borne 1—2cm apart on a creeping rhizome, clothed in leaf bases or sheaths, about 6- to 10-leaved towards apex. Leaves coriaceous flat, suberect, distichous, narrowly oblong- to elliptic-lanceolate, obscurely unequally bilobed at apex, 6—8 x 1.6—2.5cm, each with a basal sheath up to 4cm long. Inflorescences terminal or subterminal, erect to spreading, about 17cm long, laxly few-flowered; peduncle slender, terete; bracts triangular, acute, 2mm long. Flowers subnutant; sepals cream; petals cream with apices purplish on outer side; lip white delicately marked with purple; ovary purplish-red. Dorsal sepal porrect, linear-lanceolate, subacute, 2.5 x 0.5cm, with side margins upturned; lateral sepals slightly falcate and incurved, oblong-lanceolate, subacute, 2.8 x 0.6cm; mentum pointing backwards and slightly upcurved, hook-like, 6mm long. Petals recurved or erect, linear, twisted up to 3 times, 2.8—3 x 0.2cm. Lip elliptic in outline, 3-lobed in apical half, somewhat recurved at apex, 1.45 x 0.75cm; side lobes erect, narrowly oblong, rounded in front; mid lobe ovate, acute, with undulate margins; callus of five fleshily thickened longitudinal ridges on to centre of mid lobe. Column 4mm long, with an erose apical margin and 2 acute stelidia; foot sinuous, 6mm long, pubescent towards apex.

Papua New Guinea: Enga Prov., Lagaip Distr., Yondalia, **Reeve** 400! (K, holotype); S. Highlands Prov., Erave, **Reeve** 377!

Irian Jaya: Vogelkop Peninsula, Ajamaroe (Ajamaru); Misool Isl., Fafanlap; and Biak Isl. All fide van Bodegom (1973). Habitat: An epiphytic or lithophytic plant growing in montane areas and according to van Bodegom (1973) in Karst areas; 1100—1800m.

D. hamiferum is allied to *D. crispilinguum* with which it shares smallish flowers and a distinctive upcurved hook-like mentum. However, it way be readily distinguished from that species by its incurved sepals and small less brightly coloured lip in which the mid lobe margins are not crispate.

Van Bodegom (1973) recognised this species as new and listed 3 localities for it in Irian Jaya which I have cited above. Good black and white photographs of living plants are also provided by him.

REFERENCES:

Schlechter, R. (1912)	Fedde Repert. Beih. 1:545-546.
van Bodegom, J. (1973)	Enige Orchideeën van West Nieuw Guinea, 100-101.

ACKNOWLEDGEMENTS:

My thanks are due to the Australian Orchid Foundation, G. Hermon Slade, Alasdair Morrison, N. Howcroft, J. Croft and many others for their help on my recent visit to Australasia but particularly to Tom Reeve for his considerable help and advice with the present and other problems with New Guinea orchids.

Royal Botanic Gardens
Kew, Richmond, Surrey
TW9 3AB, England

January, 1981

ORCHIDS FROM CURTIS'S
BOTANICAL MAGAZINE

A collection of 26 single and 5 double plates in full colour will be published in August this year.

See Editorial page, this issue, for details.

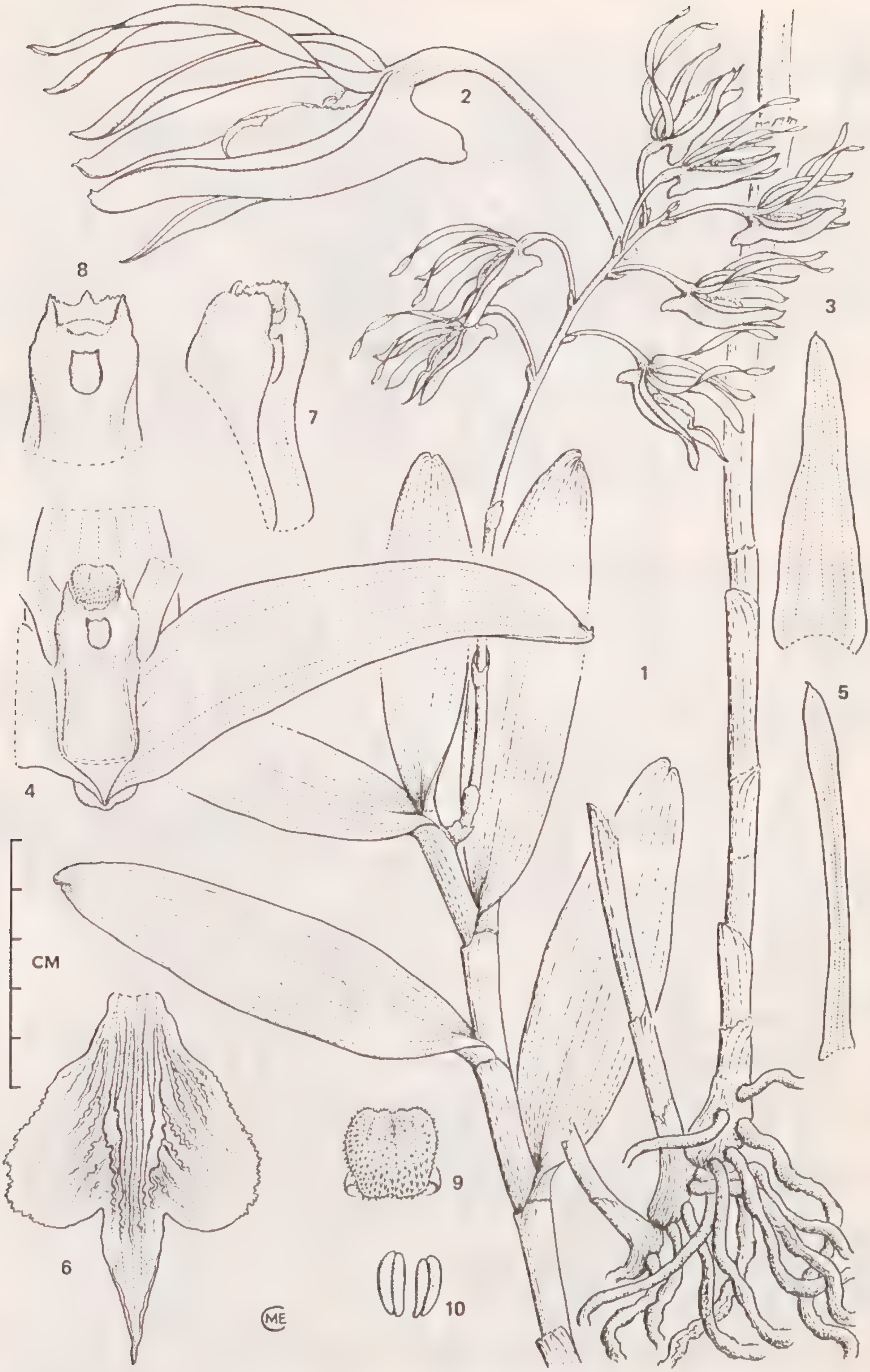

FIG. 1: *Dendrobium magistratus* Cribb sp. nov.

1	habit	to indicated scale	x 1	6	lip	to indicated scale	x 3
2	flower	" " "	x 3	7	column side view	" " "	x 6
3	dorsal sepal	" " "	x 3	8	column front view	" " "	x 6
4	lateral sepal and column	" " "	x 4½	9	anther cap	" " "	x 9
5	petal	" " "	x 3	10	pollinia	" " "	x 9

All drawn from **Reeve** 393 by Maureen Church.

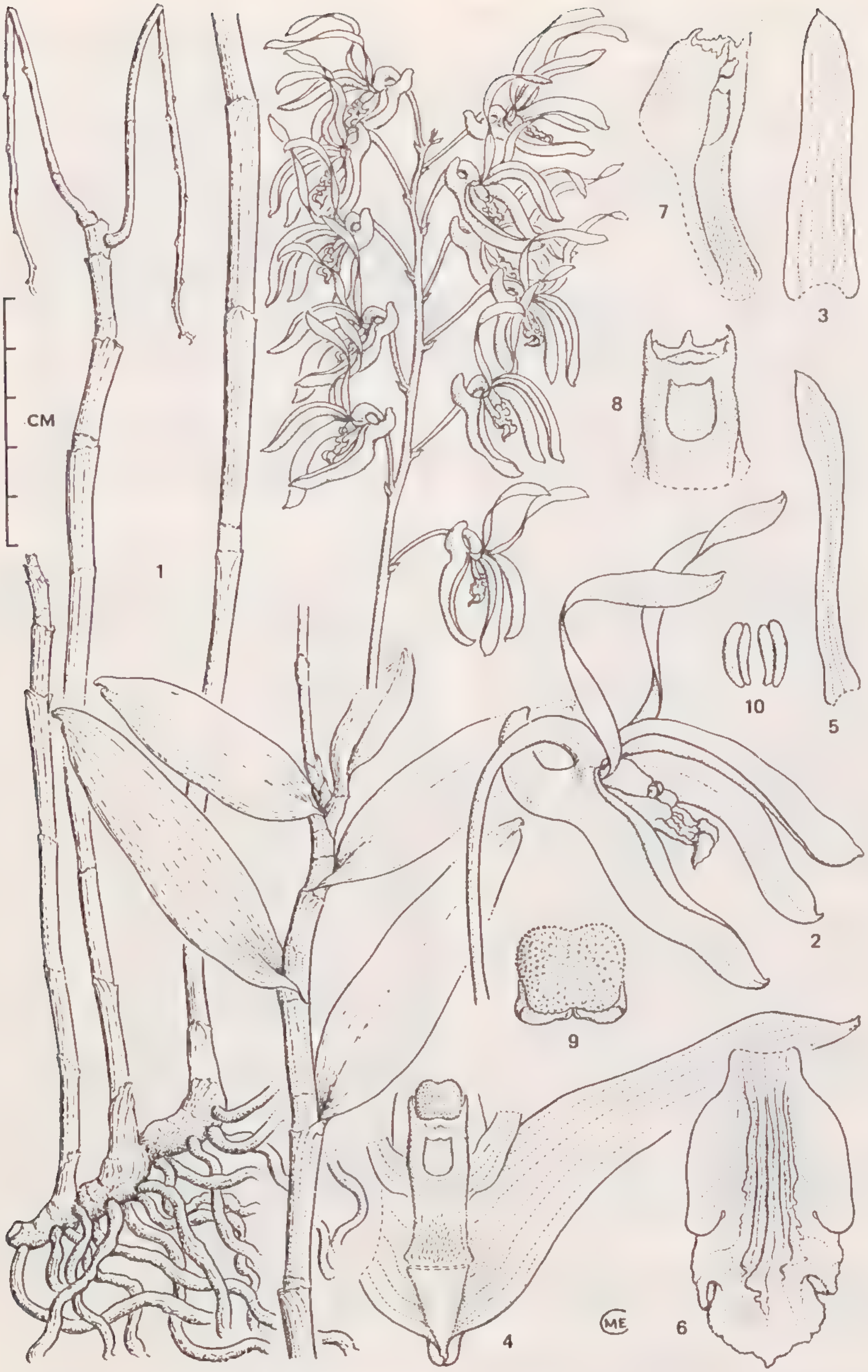

FIG. 2: *Dendrobium hamiferum* Cribb sp. nov.

1	habit	to indicated scale	x 1	6	lip	to indicated scale	x 3
2	flower	" " "	x 3	7	column side view	" " "	x 7½
3	dorsal sepal	" " "	x 3	8	column front view	" " "	x 7½
4	lateral sepal and column	" " "	x 4½	9	anther cap	" " "	x 9
5	petal	" " "	x 3	10	pollinia	" " "	x 9

All drawn from Reeve 400 by Maureen Church.

A PRELIMINARY KEY TO *DENDROBIUM* SECT. *LATOURIA*
(Including Three Newly Described Species.)

by P.J. Cribb

Summary: A preliminary key to species of *Dendrobium* sect. *Latouria* is provided together with an index of accepted names and synonyms. Reasons for publishing this preliminary account of the section are outlined. Three new species are described and illustrated.

Following the 9th World Orchid Conference in Bangkok, the International Orchid Commission (IOC) requested the assistance of the Royal Botanic Gardens, Kew, to revise two sections *Latouria* and *Ceratobium* of the genus *Dendrobium*. Species of both sections have in recent years been seen in increasing frequency in orchid collections and have been used successfully to produce numerous hybrids. However, registration of these has proved difficult or impossible because many of the species are poorly known or even undescribed and published names are often difficult to apply to the cultivated plants. (For a more detailed discussion of the problem facing the taxonomist working on New Guinea orchids see Reeve & Woods, loc. cit. 1980).

A full revision of section *Latouria* is in an advanced state of preparation and will be published shortly but the key published here is intended as a trial-run for growers to use on the plants in their collections; for although I have seen living plants of many of the species there are several I have only seen as herbarium specimens. I would appreciate comments on the key of a practical nature.

A PROVISIONAL KEY TO THE SPECIES OF *DENDROBIUM* SECT. *LATOURIA*

1. Flowers with setosely hairy ovaries; sepals and pedicel more or less hairy as well:
    2. Petals over 2cm broad (rarely only 1.5cm broad); sepals scarcely hairy:
        3. Lateral sepals broadly lacerately keeled; keels 3–7mm broad . . . . *D. forbesii*
        3. Lateral sepals narrowly keeled or not keeled:
            4. Petals over 2.7cm broad; mid-lobe or lip apiculate, ± equal to side lobes . . . . *D. eximium*
            4. Petals less than 2.5cm broad; mid-lobe of lip larger than the side lobes, 3-lobulate when spread out and with a triangular apex . . . . *D. forbesii*
    2. Petals 0.5 to 1.5cm broad; sepals markedly hairy on outer surfaces:
        5. Side lobes of lip subquadrate, broader than long:
            6. Sepals over 3cm long, densely covered with long setae; lip mid-lobe not strongly recurved; free part of callus on lip c. 7mm long, obviously 3-ridged; petals over 1.2cm broad; column-foot bearing a decurved ligule in the middle . . . . *D. finisterrae*
            6. Sepals less than 2.5cm long, sparsely or moderately covered with long setae; lip mid-lobe recurved; free part of callus on lip less than 3mm long, obscurely 3-ridged; petals less than 1cm broad; column-foot lacking a decurved ligule . . . . *D. macrophyllum*
        5. Side lobes of lip oblong or tapering somewhat towards apex, always longer than broad:
            7. Side lobes of lip oblong, not tapering at apex; apex of callus on lip very obscurely 3-ridged and low; leaves mostly 3, oblong-elliptic . . . . *D. macrophyllum*
            7. Side lobes of lip tapering somewhat to apex; apex of callus 3-ridged and prominent; leaves 2, elliptic . . . . *D. polysema*
1. Flowers lacking any setose hairs on ovary, pedicel or sepals:
    8. Mentum saccate or subsaccate but never conical:
        9. Mid-lobe of lip, deeply emarginate, large, more than half the size of the side-lobes:
            10. Pseudobulbs ovoid, about 8-angled, less than 2cm long . . . . *D. uncipes*
            10. Pseudobulbs clavate or fusiform not noticeably angled, rarely less than 6cm long and often much longer:
                11. Flowers white, ± marked with red or purple on column and base of lip only; veins at base of lip side-lobes fleshily thickened; mid-lobe cleft to about midway . . . . *D. aberrans*
                11. Flowers green or cream-coloured with a pink-purple lip; veins on side-lobes of lip not or scarcely thickened; mid-lobe cleft almost to base:
                    12. Mentum less than 4mm long; lip about 6mm long, 6.5mm broad; leaves 5–6.7 x 1.2–1.6cm . . . . *D. curvimentum*
                    12. Mentum more than 5mm long; lip 8–12mm long, 12–18mm broad when spread, leaves 8–12 x 2–2.8cm long:
                        13. Mid-lobe of lip much longer than side lobe, each lobule equal in size and shape to side lobes; veins on side lobes rugulose . . . . *D. woodsii*
                        13. Mid-lobe of lip about as long as side lobes, each lobule much smaller than side lobes and acute; veins on side lobes not rugulose . . . . *D. fantasticum*
        9. Mid-lobe of lip entire, very much smaller than side-lobes:
            14. Leaf linear-lanceolate, solitary, 9–14 x 0.8cm; inflorescence less than 2cm long; side-lobes of lip at right angles to the claw and with entire margins; callus on lip with a free apex more than 2mm long; mid-ridge of callus shorter than the acute and higher side ridges; petals acute with entire margins . . . . *D. pleurodes*
            14. Leaves 1–2, subovate-elliptic, 3.5–4 x 1.25–1.45cm; inflorescence over 5cm long; side-lobes of lip at an acute or obtuse angle to each other when flattened and with an erose apical margin; callus on lip lacking a free apex; mid-ridge of callus longer than the lower side ridges; petals rounded at apex with erose margins . . . . *D. dendrocolloides*
    8. Mentum conical to obliquely conical in side view:
        15. Leaf distinctly narrowly petiolate; petiole more than 1.5cm long; pseudobulbs fusiform or shortly stalked-fusiform, glossy red-brown; lip obscurely hexagonal when flattened; flower pale green, mostly spotted with red or purple . . . . *D. cruttwellii*
        15. Leaf obscurely petiolate or sessile; petiole (if present) relatively stout, less than 1cm long; pseudobulbs and lip not as above:
            16. Pseudobulbs very small, ovoid or ellipsoid, less than 2.5cm long:
                17. Lip petaloid, entire, lacking a callus . . . . *D. simplex* (peloric)
                17. Lip subquadrate, with a three-ridged callus . . . . *D. simplex*
            16. Pseudobulbs fusiform to clavate or cylindrical, more than 5cm long, often much longer:
                18. Leaves linear to very narrowly oblong, rounded at the apex, less than 1.3cm broad:

19. Pseudobulbs clavate; sepals and petals less than 1.4cm long; mentum somewhat incurved in side view; ovary almost at right angles to the pedicel . . . . . . *D. wisselense*

19. Pseudobulbs cylindrical, ± obscurely thickened above; sepals and petals 2cm or more long; mentum straight; ovary scarcely forming an angle with the pedicel . . . *D. rhomboglossum*

18. Leaves ovate or lanceolate to elliptic or oblong-elliptic:

20. Petals rhombic, obovate or oblanceolate, longer and mostly broader than the sepals:

21. Lip distinctly three-lobed:

22. Lip mid-lobe lanceolate, much longer than broad; petals rhombic, acute . *D. johnsoniae*

22. Lip mid-lobe ovate, broadly ovate or transversely oblong; petals obovate or oblanceolate, acuminate or acute:

23. Petals and sepals cream-coloured, spotted with purple; lip fleshy, heavily veined purple; mid-lobe much longer than side-lobes and recurved . . . . *D. atroviolaceum*

23. Petals and sepals white, mostly unspotted; lip thin-textured not heavily veined with purple; lip not noticeably recurved:

24. Lip almost as broad as long when flattened, apiculate, white; mid-lobe not much longer than side-lobes; margins of side-lobes red-or purple-spotted . . . . . . *D. rhodostictum*

24. Lip much longer than broad when flattened, acute; mid-lobe much longer than side-lobes:

25. Lip longer than lateral sepals, veined yellow; pseudobulbs circular in cross section . . . . . . *D. kauldorumi*

25. Lip shorter than or equal to lateral sepals, veined green; pseudobulb 4-angled in cross section . . . . . . *D. ruginosum*

21. Lip entire or obscurely three-lobed only:

26. Lip rhombic or elliptic in outline, broadest in the middle; petals only as broad as the dorsal sepal . . . . . . *D. mooreanum*

26. Lip obovate, broadest in the apical half; petals broader than the dorsal sepal . . . . . . *D. otaguroanum*

20. Petals lanceolate, ovate, elliptic, oblong-elliptic or oblong-obovate, as long as or shorter than the sepals:

27. Lateral sepals 2.5 or more cm long (measured along mid-vein):

28. Margins of mid-lobe of lip markedly undulate:

29. Petals linear-lanceolate, more than 3.5cm long often much longer; lip mid-lobe lanceolate, often twisted; lateral sepals more than 3cm long; sepals and mid-lobe of lip veined with purple . . . . . . *D. spectabile*

29. Petals oblong to oblong-obovate, less than 2.5cm long; lip mid-lobe transversely oblong when flattened, strongly recurved; lateral sepals about 2.5cm long; sepals and mid-lobe of lip spotted purple . . . . . . *D. tapiniense*

28. Margins of mid-lobe of lip not undulate:

30. Lip lobed in the apical third or quarter; flowers mostly yellow or orange or rarely white, ± spotted with purple; pseudobulb not dilated above . . . . . . *D. terrestre*

30. Lip lobed in basal half or in the middle; flowers mostly cream or yellow, marked with purple; pseudobulbs clavate or fusiform:

31. Sepals and lip mid-lobe acuminate; petals lanceolate or narrowly elliptic-lanceolate, less than 1cm broad:

32. Lip mid-lobe lanceolate, more than 3.5cm long, spotted with purple; petals more than 4cm long, with markedly undulate margins . . . *D. alexandrae*

32. Lip mid-lobe broadly ovate, 1.5cm long and broad, veined heavily with purple; petals 2—2.5cm long, lacking markedly undulate margins . *D. hodgkinsonii*

31. Sepals and lip mid-lobe acute but never acuminate; petals elliptic-obovate, more than 1cm broad . . . . . . *D. engae*

27. Lateral sepals less than 2.5cm long and mostly less than 2cm long:

33. Lip projecting from flower with a deflexed mid-lobe, transversely oblong to broadly elliptic in shape; lip lobed at middle or near middle:

34. Side-lobes of lip as large as or larger than the mid-lobe and overlapping it . *D. biloculare*

34. Side-lobes of lip smaller than the mid-lobe:

35. Side-lobes of lip oblong, incurved, veined with purple; mid-lobe suffused maroon; callus on lip smoothly three-ridged at base and prominently bilobed at the apex . . . . . . *D. convolutum*

35. Side-lobes of lip tapering to an acute or subacute apex; callus on lip rugulose, obscurely ridged or three-ridged to apex:

36. Side-lobes of lip linear, acute; sepals and petals spotted or streaked with purple; flowers many, clustered; bracts 2—4mm apart on rhachis; plant generally large . . . . . . *D. bifalce*

36. Side-lobes of lip tapering to a subacute or rounded apex; sepals and petals lime-green; flowers few, well spaced on rhachis; plant generally rather small . . . . . . *D. bairdianum*

33. Lip more or less enclosed or within the lateral sepals; mid-lobe never spreading-deflexed and scarcely projecting from the flower; lip lobed in apical part:

37. Leaves elliptic to subcircular, more or less rounded at the apex, often more than 3 distributed at well spaced intervals in the apical half of the stem:

38. Lip markedly three-lobed; mentum borne at an acute angle to the ovary . . . . . . *D. acutisepalum*

38. Lip obscurely three-lobed or entire; mentum often slightly incurved or at right angle to the ovary . . . . . . *D. rigidifolium*

37. Leaves ovate or lanceolate, acuminate, acute or subacute:

39. Lateral sepals more or less as long as broad (i.e. as long as the mentum) but never more than 1½ times longer than broad:

40. Lip deeply three-lobed; mid-lobe transversely oblong; sepals and petals apiculate:

41. Lip mid-lobe very fleshy, rugulose; side-lobes much shorter than the mid-lobe; ovary with a black scurfy indumentum; mentum less than 6mm long . . . . *D. subquadratum*

41. Lip mid-lobe relatively thin-textured, smooth; side-lobes elongate, almost as long as mid-lobe; ovary lacking a scurfy indumentum; mentum mostly more than 9mm long:

42. Flower creamy-white to pale green . . . . *D. punamense*

42. Flower yellow with an orange-red lip . . . . *D. euryanthum*

40. Lip obscurely three-lobed or entire; mid-lobe if present obscure; sepals and petals acute, subacute (or in *D. informe* apiculate):

43. Ovary and flower densely black-spotted; callus in middle of lip obscure or absent . . . . *D. informe*

43. Ovary and flower not spotted with black; callus well-defined, running from base to at least the middle of the lip:

44. Callus on lip three-ridged; petals more than 3mm broad; bracts less than 6mm long:

45. Lip geniculate at base, apiculate at apex . . . . *D. leucohybos*

45. Lip not geniculate at base, obtuse or retuse at apex:

46. Lip recurved in side view; callus not undulate in side view; mentum somewhat incurved . . . . *D. pachystele*

46. Lip straight in side view; callus green, undulate, raised at base and at apex; mentum straight . . . . *D. armeniacum*

44. Callus on lip unridged; claw of lip notched on each side; petal 2mm or less broad; bracts 8–12mm long . . . . *D. mayandyi*

39. Lateral sepals ± twice as long as broad:

47. Lip entire, rhombic or rhombic-elliptic in outline or obscurely 3-lobed towards apex . . . . *D. mooreanum*

47. Lip three-lobed in apical half:

48. Mid-lobe of lip ovate or oblong-ovate, acute, over one-third length of lip, pseudobulbs clavate:

49. Lip longer than the lateral sepals, 2-ridged at the apex . . . *D. kauldorumi*

49. Lip shorter than the lateral sepals, obscurely three-ridged at apex . . . . *D. ruginosum*

48. Mid-lobe of lip subquadrate, truncate or obscurely apiculate, about a quarter the length of the lip; pseudobulbs scarcely dilated above . . . . *D. torricellense*

N.B.: Three species *D. violascens* J.J.Sm., *D. laurensii* J.J.Sm. and *D. ruttenii* J.J.Sm., have not been included in this key as I have yet to see any material of these. All three species are from the Moluccas.

The following three species, all from New Guinea, are newly described here.

Dendrobium armeniacum **Cribb sp. nov. affinis** ***D. euryantho*** **Schltr sed floribus minoribus mento brevi recto labello non recurvato callo tricristato basi et apice prominente satis differt. Typus: Papua New Guinea,** ***Reeve*** **397A (K, holotypus; LAE, isotypus).**

A pendulous epiphytic herb. **Pseudobulbs** clustered, to 15 x 0.5cm, scarcely clavate, about 3-noded, yellow when dry, two-leaved at the apex. **Leaves** up to 11 x 3.5cm, lanceolate, acuminate, twisted at base to lie in one plane, relatively thin-textured. **Inflorescence** apical or lateral from node below lowermost leaf, 6–8cm long, suberect 3- to 10-flowered; bracts 3–4mm long, triangular-lanceolate, acute. **Flowers** fleshy, not opening widely, white, greenish-ochre or orange with red striations on the lip. **Dorsal sepal** 10 x 5.5mm, ovate, subacute; lateral sepals 9–10 x 6–8mm, obliquely triangular-ovate, subacute; **mentum** obliquely conical, 6–7mm long. **Petals** 7.5 x 3mm, narrowly elliptic-oblong, acute. **Lip** 9.5 x 6mm, cucullate, three-lobed in apical half, difficult to flatten; side lobes erect, rounded in front, shorter than mid-lobe; mid-lobe 5.5mm broad, transversely oblong; callus fleshy, 3-ridged, raised at base and apex. **Column** 3mm long, slightly erose at apex; foot 6–7mm long. (Figure 1)

Papua New Guinea. Southern Highlands P., Nondugl, Arl. R., *Mason* 5X!; sine loc., *Chadim* CH 114!; Madang P., Saidor D., Bambu, June 1980, *Reeve* 417!; Enga P., Lagaip D., Paiela Census Division, Komanga, Oct. 1979, *Reeve* 397A! (Type).

Habitat: Epiphyte in montane forests; 1500–2400m.

D. armeniacum is allied to *D. euryanthum* with which it is sometimes found in the wild. Like that species it characteristically has orange flowers and leaves which are twisted at the base to lie in one plane but it differs in having a shorter less prominently conical mentum 6–7mm long and a green callus which is ridged and dilated at the apex and base.

Dendrobium wisselense **Cribb sp. nov. affine** ***D. otaguroano*** **A.D. Hawkes sed foliis linearibus vel anguste ellipticis floribus minoribus labello angustato satis distinguendum. Typus: Irian Jaya, Wissel Lakes Region, near Digitaria Pass,** ***P.J. Eyma*** **5385 (holotypus, L).**

An erect epiphyte or terrestrial herb to about 38cm tall. **Pseudobulbs** slenderly clavate, 2- to 5-noded, 7–22cm long, up to 8mm diameter, 2-leaved at the apex. **Leaves** coriaceous, suberect, linear to narrowly elliptic-oblong, minutely emarginate at rounded apex, up to 8.5cm long, 1–1.2cm broad. **Inflorescence** erect or suberect, 8–16cm long, 8- to 20-flowered; peduncle and rhachis terete, slender; bracts lanceolate, acuminate, 2–3mm long. **Flower** colour not known; ovary verruculose, at right angles to the pedicel. **Dorsal sepal** lanceolate, acuminate, 12–13.5 x 3.5mm; later sepals obliquely lanceolate, acuminate, 12–14 x 6mm. **Petals** narrowly oblanceolate, acuminate, 11–13.5 x 3mm. **Lip** very obscurely 3-lobed, obovate-spathulate, apiculate, 14 x 7.5mm; callus linear, 3-ridged, half the length of the lip, mid-ridge smaller than side ridges. **Column** 2mm long; filament 0.6mm long; anther cap verruculose. (Figure 2)

Irian Jaya: Wissel Lakes Region, S. border of L. Paniai, from Kotemboe to Torerio, 28 Jan. 1939, *P.J. Eyma*

Fig. 1:

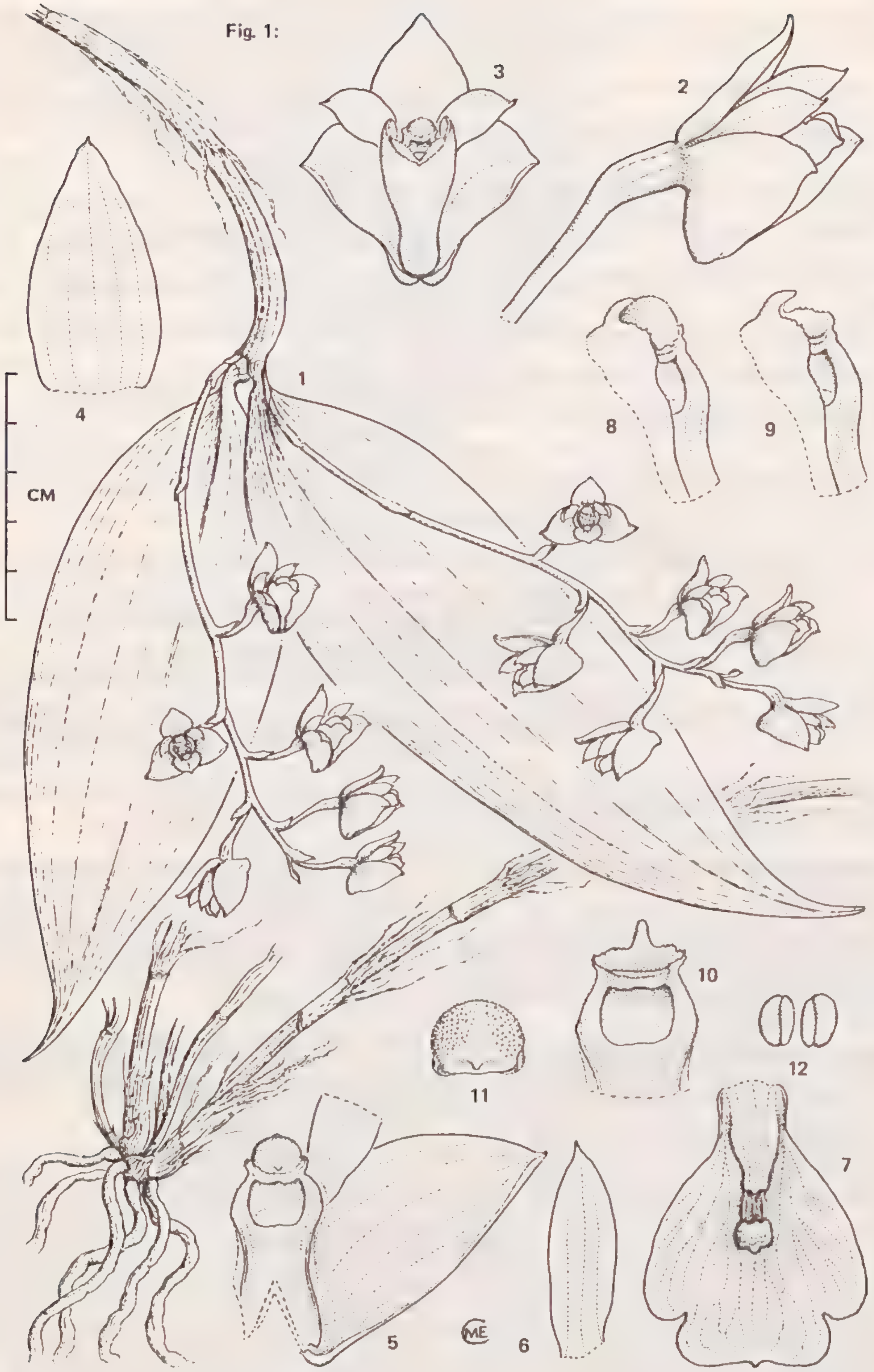

Fig. 1: *Dendrobium armeniacum* Cribb sp. nov.

1	habit	to indicated scale	x 1	7	lip	to indicated scale	x 4½
2	flower side view	" " "	x 3	8	column apex and anther side view	" " "	x 6
3	flower front view	" " "	x 3	9	column apex side view	" " "	x 6
4	dorsal sepal	" " "	x 4½	10	pollinia	" " "	x 9
5	lateral sepal and column	" " "	x 4½	11	anther cap	" " "	x 9
6	petal	" " "	x 4½				

All drawn from *Reeve* 397a by Maureen Church.

Fig. 2:

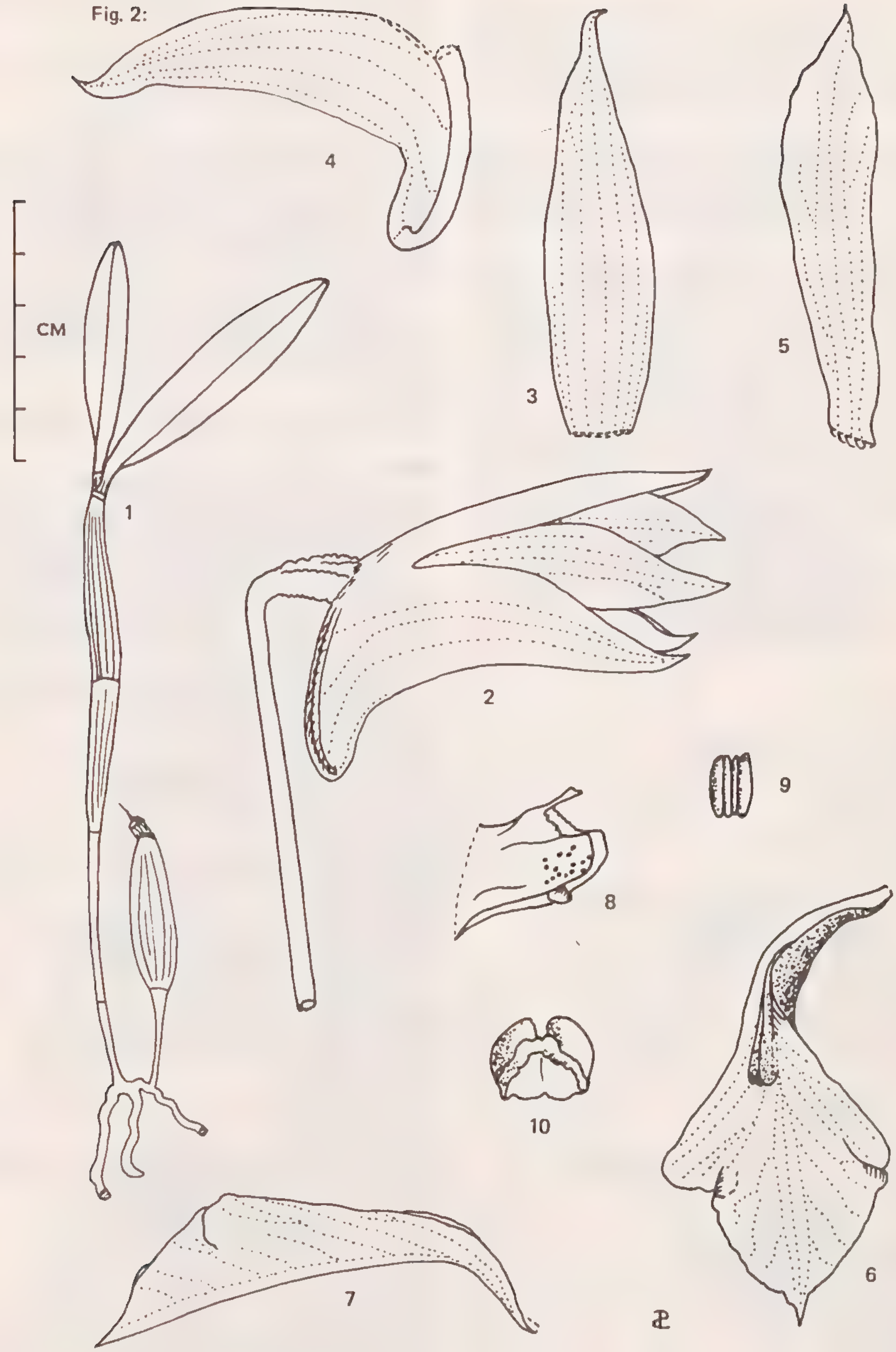

Fig. 2: *Dendrobium wisselense* Cribb sp. nov.

1	habit	to indicated scale	x 1
2	flower	" " "	x 6
3	dorsal sepal	" " "	x 6
4	lateral sepal and column foot	" " "	x 6
5	petal	" " "	x 6
6	lip flattened	to indicated scale	x 6
7	lip side view	" " "	x 6
8	column apex side view	" " "	x 12
9	pollinia	" " "	x 12
10	anther cap	" " "	x 12

All drawn from *Eyma* 5385 by P.J. Cribb.

4457! (L) & near Digitaria Pass, 1 Nov. 1939, *P.J. Eyma* 5385! (L, holo.).

Habitat: Unknown; about 1750m.

D. wisselense is allied to *D. otaguroanum* and *D. kauldorumi* but is readily distinguished from both by its linear to narrowly elliptic-oblong leaves less than 1.2cm broad and by its entire or subentire somewhat spathulate, apiculate lip.

It is apparently confined to the Wissel Lakes region of Irian Jaya but nothing is known of its habitat.

Dendrobium woodsii **Cribb sp. nov. affine *D. fantastico* L.O. Williams sed labello lobis mediis longioribus latioribusque et callo dissimili distinguendum. Typus: Papua New Guinea, *Woods* 3221 (holotypus, K!; isotypus, E!).**

An epiphytic herb. **Pseudobulbs** clustered, fusiform-clavate, up to 40cm long, 10–13mm in diameter, about 5-noded, yellowish-green, clothed with persistent sheaths when young, two-leaved at apex. **Leaves** suberect to spreading, coriaceous, sessile to very shortly petiolate, elliptic, acute, up to 18 x 3.5cm, glossy dark green above. **Inflorescences** apical or through base of leaf sheaths, as long as or shorter than the leaves, arcuate to pendulous, 4- to 7-flowered; peduncle wiry, terete, 1mm in diameter; bracts semi-amplexicaul, ovate-deltoid, acute, 3–4mm long. **Flower** pendent; sepals and petals white, tinged green; lip pink with darker pink at the base; pedicel and ovary white. **Dorsal sepal** ovate-oblong, obtuse or emarginate at apex, about 8 x 5mm; **lateral sepals** obliquely ovate-oblong, obtuse, about 12 x 6mm; mentum saccate, about 5–6mm long. **Petals** linear-spathulate, subfalcate, truncate or rounded at apex, 10 x 2–3mm, with erose margins towards apex. **Lip** flabellate in outline, about 15 x 15–17mm; side lobes spreading, oblong, obliquely truncate; mid-lobe longer than side lobes, bilobulate, with each lobule oblong-obovate, obtuse; callus raised, fleshy, obscurely three-ridged, acute at apex. **Column** short, 3mm long; foot about 10mm long, incurved, adnate to the lateral sepals; anther cap subglobose. (Figure 3)

Papua New Guinea: Milne Bay District, Mt. Gaugon, 3 Aug. 1962, *Cruttwell* 1226!; Central District, Murray Pass, *P. Woods* 3221! (holotype).

Habitat: Epiphytic in montane forest; up to 2300m altitude.

This attractive species was illustrated in Curtis's Botanical Magazine (n.s. t. 727) in 1977 as *D. fantasticum* L.O. Williams. It is undoubtedly closely allied to that species but differs markedly in its lip shape and callus structure. In *D. fantasticum* the lip mid-lobe commonly does not exceed the side lobes and is divided into two tapering acute lobules.

This species is named in honour of Mr P. Woods of the Royal Botanic Garden, Edinburgh, who collected the Type specimen. The plant from which the Type was made is still growing well in Edinburgh.

References:

Reeve, T. & Woods, P. (1980) – Orchadian 6(9): 195-208.

Acknowledgements:

I would like to thank the Directors of the Australian Orchid Foundation, G. Hermon Slade, A. Morrison, Tom Reeve and many others whom I met on my recent visit to Australasia for their generous help. In particular, I would like to thank Tom Reeve for his kindness in making available to me his unpublished notes on many species of the section and for his valuable comments on my earlier unpublished attempts at producing a workable key.

INDEX OF ACCEPTED NAMES AND SYNONYMS

aberrans Schltr.
acutisepalum J.J. Sm.
alexandrae Schltr.
alpinum van Royen = rigidifolium
armeniacum Cribb
ashworthiae O'Brien = forbesii
atroviolaceum Rolfe
bairdianum F.M. Bail.
bellum J.J. Sm. = eximium
bifalce Lindl.
biloculare J.J. Sm.
brachythecum F. Muell. & Kränzl. = macrophyllum
breviracemosum F.M. Bail. = bifalce
chloroleucum Schltr. = otaguroanum
chloropterum Rchb.f. & S. Moore = bifalce
convolutum Rolfe
cruttwellii Reeve
curvimentum J.J. Sm.
dendrocolloides J.J. Sm.
euryanthum Schltr.
eximium Schltr.
engae Reeve
fairfaxii Muell. = mooreanum
fantasticum L.O. Williams
ferox Hassk. = macrophyllum
finisterrae Schltr.
finisterrae var. polystictum Schltr. = finisterrae
forbesii Ridl.
forbesii var. praestans Schltr. = forbesii
giddinsii T. Hunt = bairdianum
giluwense van Royen = rigidifolium
gordonii S. Moore = macrophyllum
guttatum J.J. Sm. = rigidifolium
helenae Chadim = rigidifolium
hodgkinsonii Rolfe
informe J.J. Sm.
johnsoniae F. Muell.
kauldorumi Reeve
laurensii J.J. Sm.
leucohybos Schltr.
leucohybos var. leucanthum Schltr. = leucohybos
macfarlanei Rchb.f. = johnsoniae
macrophyllum A. Rich.
macrophyllum var. giganteum Hort. = macrophyllum
macrophyllum var. malaccense Hort. = macrophyllum
macrophyllum var. pallidum Hort. = macrophyllum
macrophyllum var. stenopterum Rchb.f. = polysema
macrophyllum var. subvelutinum J.J. Sm. = macrophyllum
madonnae Rolfe = rhodostictum
magnificum Schltr. = terrestre
mayandyi Reeve & Renz
monodon Kränzl. = johnsoniae
musciferum Schltr. = macrophyllum
niveum Rolfe = johnsoniae
otaguroanum A.D. Hawkes
pachystele Schltr.
pachystele var. homeoglossum Schltr. = pachystele
petri Rchb.f. = mooreanum
pleurodes Schltr.
polysema Schltr.
polysema var. pallidum Chadim = polysema
priscillae A.D. Hawkes = mooreanum
psyche Kränzl. = macrophyllum
pulchrum Schltr. = polysema
punamense Schltr.
quaifei Rolfe ex Ames = mooreanum
rhodostictum F. Muell. & Kränzl.
rhomboglossum J.J. Sm.
rigidifolium Rolfe
robertsianum Hort. ined. = macrophyllum
ruginosum Ames
ruttenii J.J. Sm.
sarcopodioides J.J. Sm. = simplex
sarcostoma Teijsm. & Binnend. ex Miq. = macrophyllum
sayeria Schltr. = cruttwellii
setigerum Ames ined. = macrophyllum
sikinii Schltr. = subquadratum
simplex J.J. Sm.
subquadratum J.J. Sm.
tapiniense Reeve
ternatense J.J. Sm. = macrophyllum
terrestre J.J. Sm.
tigrinum Rolfe ex Hemsley = spectabile
tomohonense Kränzl. = macrophyllum
torricellense Schltr.
veitchianum Lindl. = macrophyllum
violascens J.J. Sm.
waterhousei Carr = punamense
wisselense Cribb
woodsii Cribb
woolastonii Ridl. = eximium

11 February, 1981

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Kew, Richmond
Surrey TW9 3AB, England

Fig. 3:

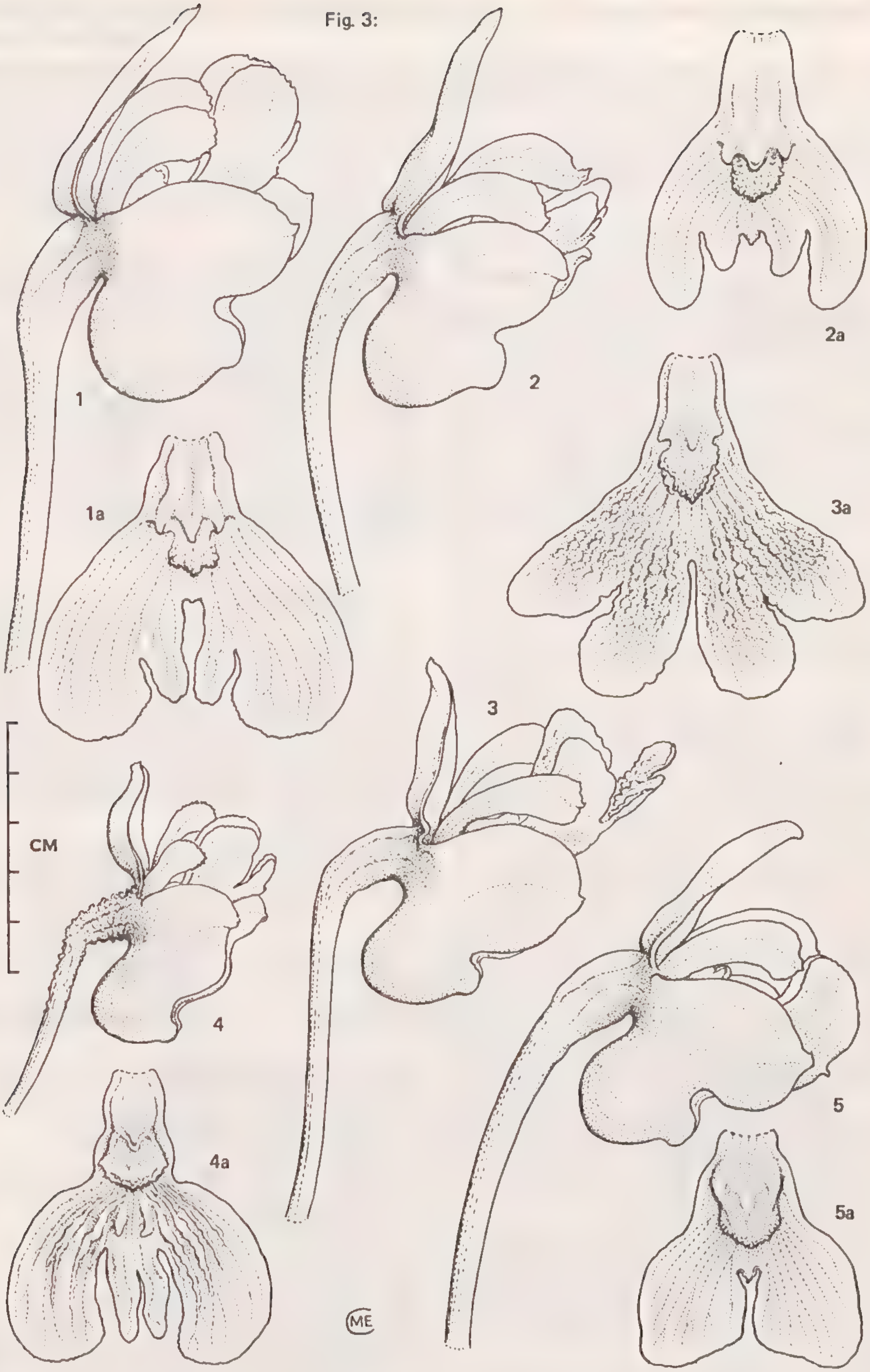


Fig. 3: *Dendrobium flowers and lips.*
1, 1a *D. fantasticum, Reeve* 355;
2, 2a *D. fantasticum, Woods* 2340;
3, 3a *D. woodsii, Woods* 3221;
4, 4a *D. aberrans, Reeve* 395;
5, 5a *D. dendrocolloides, Reeve* 183.
All drawn to indicated scale x 4½ by Maureen Church.

DENDROBIUM WULAIENSE — A New Species of Section *Ceratobium* from West New Britain Province, Papua New Guinea

by N.H.S. Howcroft

In this paper, a new *Dendrobium* species, commonly referred to as the 'Wulai Island White', is named and described. Although the species has a rather shorter inflorescence and fewer flowers to the inflorescence than many other Ceratobium species, its flower size, labellum shape and colour should ensure it a place as a parent in future breeding programmes.

Dendrobium wulaiense **Howcroft species nova affine arcte *Dendrobio odoardi* Kränzl. sed stelidiis columnae bilobatis perspicue, sepalo dorsali triangulato-lanceolato, acuto; petalis non erectis, oblanceolatis anguste, labello decurvato.**

Dendrobium wulaiense Howcroft sp. nov. close to *D. odoardi* Kränzl. but stelidia of column distinctly bilobed, dorsal sepal triangular-lanceolate, acute, petals not erect, narrowly oblanceolate, labellum decurved.

Holotype NGF 64079 in Lae, Wulai Island, Kimbe Bay, West New Britain, N. Howcroft. Isotypes NGF 64080 and 64090 in Lae, Wulai Island, Kimbe, N. Howcroft.

An epiphytic herb. **Rhizomes** short, cylindrical. **Pseudobulbs** usually erect, basal portion slightly swollen, constricted above, the remainder tapering towards both ends, thickest part closest to the base, multinodal, yellowish with maroon lines, internodes short, 10—100 x 1.2—1.75cm, leaf bearing in the apical half. **Leaves** ovate to elliptical, obtuse to emarginate, concave, straight to decurved, middle vein mildly sulcate above, below prominently raised, leathery smooth above, dull below, pale green, joined to tubular sheathing base, 6.5—13.0 x 3—13.0cm. **Inflorescences** 1—3, erect, short, 13.1—22.0cm long, peduncle approximately the same length as rhachis, with three short tubular sheaths, yellow green, bearing 4—18 lax flowers, emerging through leaf sheaths at apex of pseudobulbs; bracts of pedicels minute, adpressed, triangular, usually not concave, colour similar to pedicels, about 3 x 2mm. **Flowers** fairly large, about 5.2cm wide, white to deep cream with intense violet venation in the labellum and light violet on the ventral surface of column and foot, keels white with violet edges. **Dorsal sepal** recurved to one side, triangular-lanceolate, acute, flattened with slightly undulate margins, 2.7cm long, 0.7cm wide at base. **Lateral sepals** recurved and slightly twisted, falcate, oblong-ovate to narrowly triangular, apiculate to acute, slightly connate at end of mentum, free position beyond mentum 2.5 x 1—1.3cm. **Petals** sub-erect, more or less porrect or spreading, with a single half twist, narrowly oblanceolate, 3.4—3.5 x 0.7—0.8cm. **Labellum** joined and adnate to about the lower one-third of the column foot forming a short spur, decurved, deeply concave, three-lobed, flattened 2.6 x 2cm; mid lobe not widely separated from lateral lobes, slightly decurved, slightly concave, broadly ovate, sometimes slightly apiculate, margins undulate, 0.9—1 x 0.8—1.1cm; lateral lobes erect rounded, trapesoid, not spreading, with slightly erose margins, overlapping base of mid lobe when flattened; callus of three prominent ridges and two low lateral ridges ending more or less at base of mid lobe. **Column** short, 7mm long with 2 ventral apically bilobed stelidia; foot more or less right angled to column and ovary, 1.2cm long. **Anther** bilobed at top, papillose at base, mildly umbonate on the face. **Ovary** more or less at right angles to pedicel, about 6mm long, with pedicel about 5.4cm long.

Distribution: At present known only from Wulai Island, Kimbe Bay, near the Talasea Peninsula of West New Britain, latitude 5°21S, longitude 150°30E, and from Long Island, Madang Province, approximately 5°10S and 147°E. It is expected to occur on islands between these two localities. The species has not been found on the mainland of New Britain.

Habitat: *D. wulaiense* is very common on Wulai Island and it grows as an epiphyte on several species of trees on the island, particularly *Terminalia catappa* and on *Calophyllum inophyllum*, often overhanging the sea. Specimens may also be found on the short coral cliffs of the small island.

Flowering: The type specimen NGF 64079 flowered in captivity in May, 1980. Two other specimens from the island flowered in captivity in October & November, 1980.

Cultivation: The species will tolerate light shade but appears to be a sun-loving species. It grows well on Frangipani trees.

Notes: All specimens of this species from Long Island are cleistogamous, a feature also common among populations of *D. mirbelianum* Gandich. It appears that this is not a character of the Wulai population.

D. wulaiense has been, in the past, lumped with *D. lineale* (Millar 1978), however, the flowers of *D. wulaiense* bear no resemblance to those of *D. lineale* and its nearest relative appears to be *D. odoardi* Kränzl. The rhachis of the inflorescence of *D. lineale* is always longer than its peduncle and the flowers are well spaced, whereas with *D. wulaiense* the inflorescence is much shorter and the rhachis and peduncle more or less equal in length. The column foot and spur of *D. lineale* flowers is much longer and projects past the pedicel and ovary of the flower. As with *D. odoardi* the column of *D. lineale* does not have ventral, bilobed stelida.

ACKNOWLEDGEMENTS:

I wish to thank Mr J. Betts for preparing the Latin for the botanical diagnosis, Mr Jim Croft of Botany Division, Lae and Mr Alistair Hay of the Bulolo Forestry College, for their invaluable advice during the preparation of this paper. Special thanks are due to Mr Michael Galore, Assistant Director of the Botany Division, Lae, and his staff, for the reproduction of the illustration of *D. wulaiense.* Last but not least I thank Mr Don Mackenzie of the Bank of N.S.W. Kimbe, for providing me with the opportunity to visit Wulai Island to examine and collect this orchid.

REFERENCES:

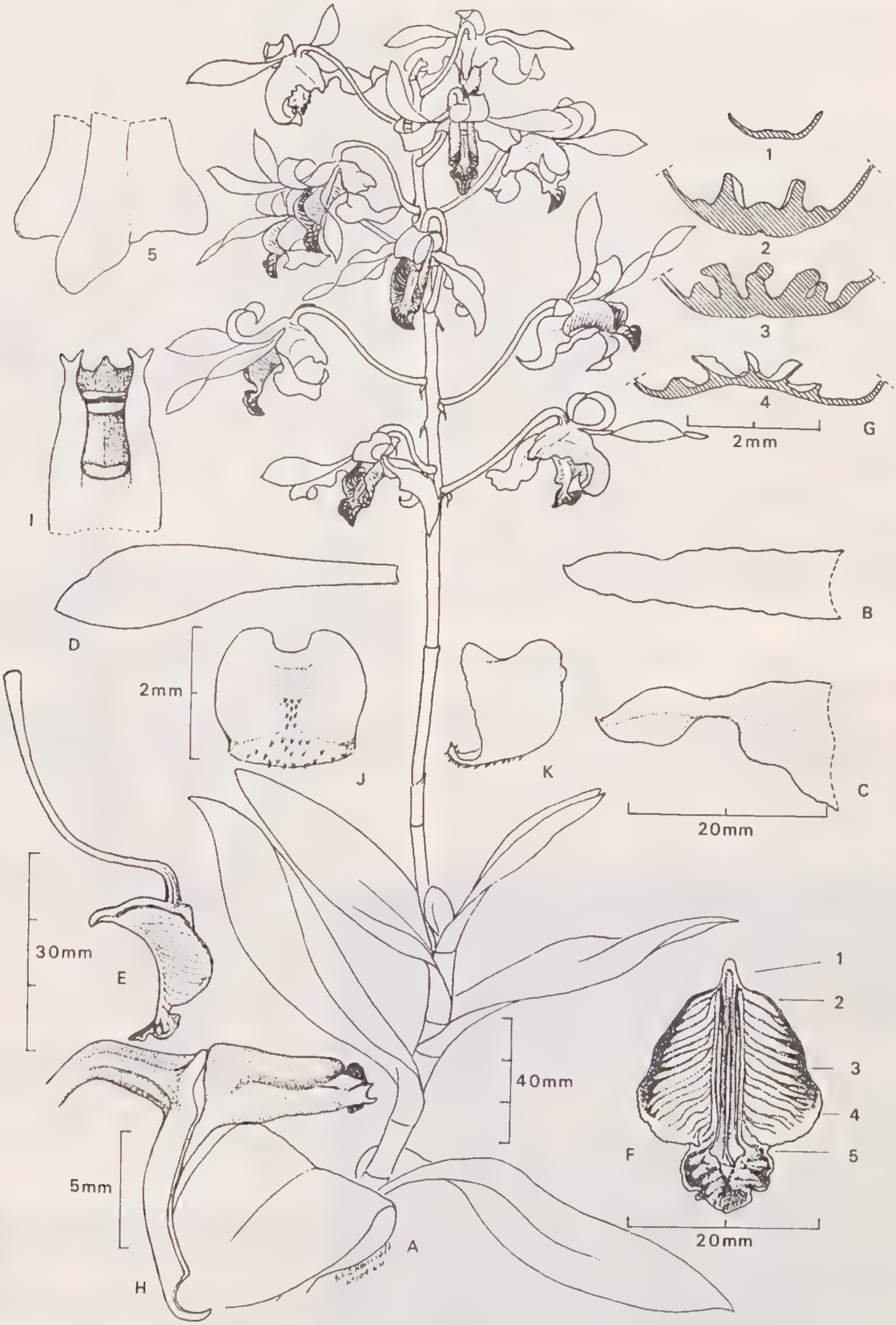
Holttum, R.E. (1964)	Flora of Malaya (Revised) Vol. 1 : Gov. Printing Office, Singapore.
Millar, A. (1978)	Orchids of Papua New Guinea. An Introduction, Australian National Univ. Press, Canberra.
Smith, J.J. (1929)	Orchidaceae. Nova Guinea 14:419—420, Table LXV, Figure 71.

3 March, 1981 **BULOLO, Papua New Guinea**

KEY TO ILLUSTRATION OF *DENDROBIUM WULAIENSE* (TYPE SPECIMEN): —

A	Portion of plant with inflorescence.
B	Dorsal sepal . . . scale as for C.
C	Lateral sepal.
D	Petal . . . scale as for C.
E	Flower stripped of petals and sepals to show lateral view of labellum.
F	Labellum flattened out.
G	Cross sections of labellum as indicated in Fig. F 1 to 5.
G1	Showing cross section of spur.
G2	Commencement of keels of callus.
G3	Keels of callus at mid section of labellum.
G4	Keels of callus approaching mid lobe of labellum.
5	End of 3 prominent keels of callus at base of mid lobe.
H	Lateral view of ovary, column, column foot and bilobed stelid.
I	Ventral view of column, showing stigma, clinandrium and bilobed stelidia . . . scale as for H.
J	Front view of anther.
K	Lateral view of anther.

Dendrobium wulaiense Howcroft (Type specimen)



Drawing: N.H.S. Howcroft

Miscellaneous Notes on New Guinea Orchids, No. 2

by T.M. Reeve

Cleisostoma paludosum **(van Royen) T.M. Reeve** ***comb. nov.*** **Basionym:** ***Sarcanthus paludosus*** **van Royen in** ***Alpine Flora of New Guinea*** **2:803, Fig. 278 (1979).**

This monopodial orchid is widespread in the mountains of Papua New Guinea being recorded from the following provinces at least: Enga, Southern Highlands, Western Highlands, Chimbu and Central. It commonly grows between 2100 and 3100 metres above sea level, but occasionally I have collected it as low as 1900m (Sinasina District, Chimbu Province).

Cleisostoma paludosum is the largest orchid of the subtribe *Sarcanthinae* to be found in the alpine zone of New Guinea so far, and the plants have remarkably thick and rigid leaves which are frost resistant. This species flowers mainly between November and April at Laiagam and the inflorescences are usually branched. The individual flowers last 2 or 3 weeks (longer at higher altitudes) but the panicle lasts much longer, opening gradually from the base upwards. The sepals and petals are green with purplish-brown markings and the labellum is white, tinged with purple inside. The plants are usually pendulous, up to 1 metre long, with the leafy end of the stem turned upwards again. Small plants may be erect as van Royen has described. The roots are very thick, up to 6mm in diameter, and the range of leaf measurements taken from 35 plants at Laiagam is 2–10 x 1.2–3.0cm.

Garay (1972) has shown that *Cleisostoma* is the correct name for this genus so the transfer is necessary. It is probable that *C. paludosum* will prove to be conspecific with *C. gjellerupii* (J.J.Sm.) Garay, the Type of which was collected from the Cyclops Mountains in West New Guinea (Irian Jaya) at 2000m. All other species of *Cleisostoma* recorded so far from New Guinea grow in the lowlands below 1100m.

Dendrobium crispilinguum **Cribb in** *Orchid Review* **88: 145-146 (1980).**

This common highland member of section *Ceratobium* was described last year in the *Orchid Review* and then (a few days) later in *The Orchadian.* However, little distribution data was given so the following additional information is supplied. *D. crispilinguum* is a common species in the Western Highlands, Chimbu, Eastern Highlands and Morobe Provinces, growing between 1100 and 1600 metres. It also occurs in the Wapenamanda area of the Enga Province (occasionally as high as 1800m, epiphytic on *Dodonaea viscosa* and *Casuarina "oligodon"*), in the Pangia area of the Southern Highlands Province , and on the lower mountains of the Finisterre Range in the Madang Province.

Dendrobium forbesii **Ridl. in** *Journ. Bot.* **24:323 (1886).**

This "most beautiful" plant as H.N. Ridley commented in 1886 was one of the earliest members of section *Latouria* to be described. The type specimen was collected by Mr H.O. Forbes on Mt. Koroko near Sogeri in what is now known as the Central Province of P.N.G. No altitude was given but from data on other collections in the same area, it was probably about 800m. *D. forbesii* grows mainly between 1000 and 1500m but occasionally I have collected it as high as 1700m.

This species has only been recorded from certain areas, often widely separated, where sometimes it is locally abundant. It has mainly been collected in the Morobe, Eastern Highlands and Central Provinces. Schlechter recorded it from the Madang Province, and I have found it growing in two areas of the Southern Highlands. Mr York Meredith also collected it in the Jimmi Valley of the Western Highlands in 1954. Further expeditions are sure to discover it growing elsewhere but at present it cannot be regarded as common.

In 1912 Schlechter described a new variety *praestans* and this name has been applied to almost all P.N.G. specimens by Mrs Andreé Millar and others. In 1979 I was able to examine Ridley's type specimens in the British Museum and found that the flowers had large serrated keels on the lateral sepals which, together with size, was the major point which Schlechter claimed separated his new variety. Therefore the variety *praestans,* not being significantly different from the original, should be regarded as synonymous. No doubt Dr P.J. Cribb will comment further on this point in his forthcoming revision of section *Latouria.* **N.B.:** The size of the keels on the lateral sepals does in fact vary in the species as with others in the section. Also the size of plants and flowers vary considerably (flowers less so) and section *Latouria* species have the happy habit of flowering from quite small plants.

Description:

Pseudobulbs clavate, often somewhat flattened; yellow or brown in colour; 5–50 x 1.3–4.0cm; with usually 2 (occasionally 3) leaves at the top of each new stem. **Leaves** elliptic to ovate-elliptic; green, sometimes strongly suffused with purple; 6–18 x 4.5–9.0cm. **Inflorescences** 3–15 flowered, with individual flowers up to 8cm across when petals are fully opened out. (**N.B.:** The wide petals add much to the beauty of this species.)

The flowers are pure white becoming creamy-white with age and some forms have purple veins on the labellum. The upper part of the pedicel, the ovary and the base of the sepals are spotted and flecked with purple. The ovary is densely hirsute or setose and this condition extends part way down the pedicel. The flowers last about 5 or 6 weeks at Laiagam. A very pleasing attribute of some forms of *D. forbesii* is the strong honey scent which is identical with that of the Yellow Box tree *(Eucalyptus melliodora)* of western New South Wales, Australia. Plants from Efogi in the Central Province have strongly scented flowers whilst those from Tari – Komo, S.H.P. are moderately scented. I could not detect any scent at all in a single flowering plant from Kainantu, E.H.P.

Cultivation:

At Laiagam (2200m) *D. forbesii* does not do well on tree fern pieces but performs satisfactorily in pots and baskets using our standard coarse mix of charcoal and washed pine bark. Care needs to be taken with new shoots as the bracts fill up with water and this can lead to rotting.

Dendrobium tapiniense **T.M. Reeve in** *Orchadian* **6 (10): 223 (1981).**

A visit was made to the Tapini area of the Central Province in December 1980 and *D. tapiniense* was found to be a fairly common epiphyte between 1400 and 1700m. Most plants were just coming into flower (season commenced in November) indicating that January is probably the peak flowering month for this species. The plant form varies considerably with some leaves very long and indistinguishable from *D. macrophyllum.* A set of pressed specimens was made for wide distribution to herbaria (*T.M. Reeve* 427).

Collections of plants were also made in the Guari Patrol Post area north of Tapini (bordering the Garaina area of the Morobe Province). Several large plants of *D. tapiniense* were seen on a large unidentified tree but they were completely out of reach. Only a single specimen was collected nearby growing high up on the highland betel nut palm *(Areca macrocalyx).*

Reference:

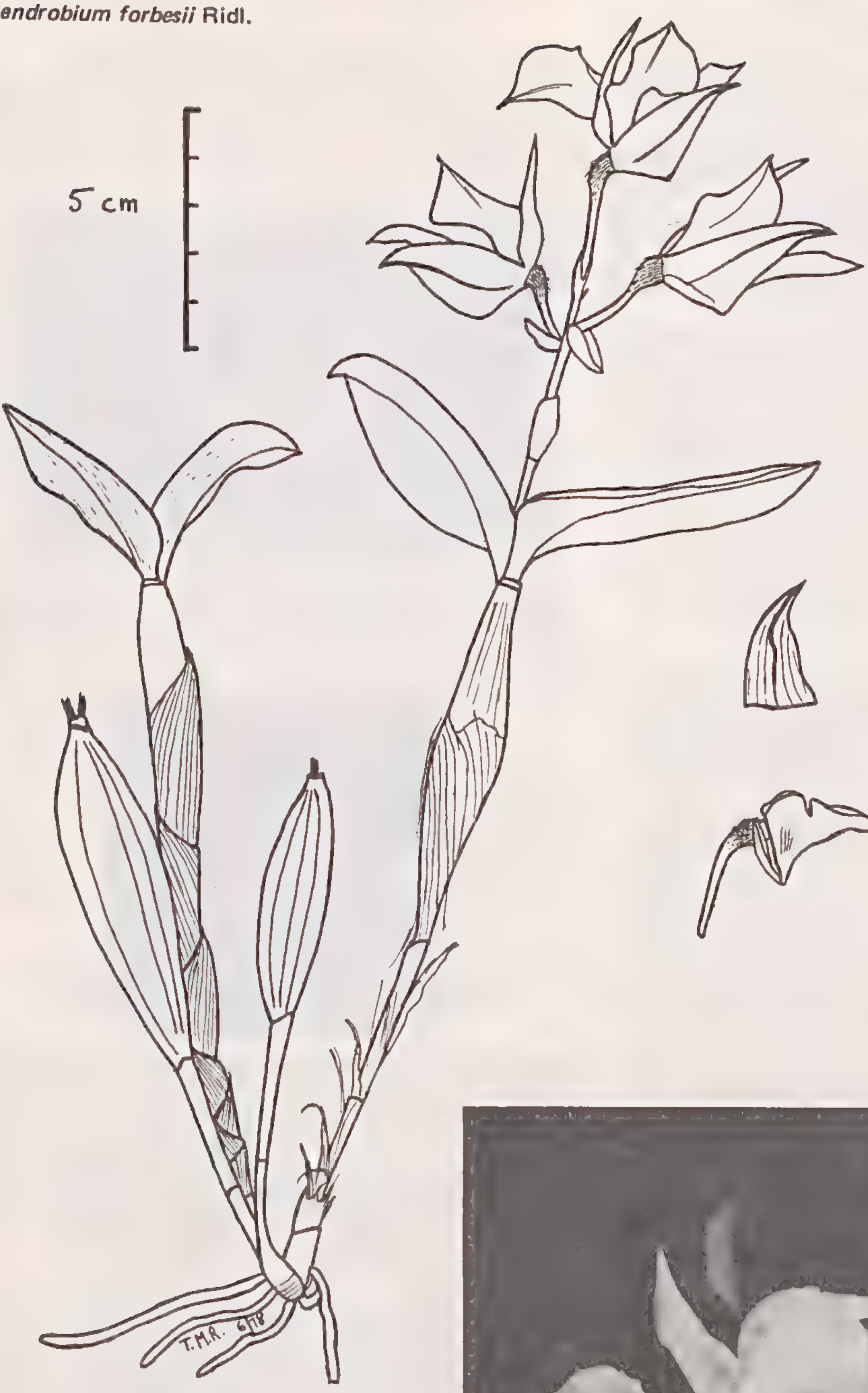
Garay, L.A. (1971): On the Systematics of the Monopodial Orchids 1. Bot. Mus. Leafl. Harv. Univ. 23 (4): 168-176, 200.

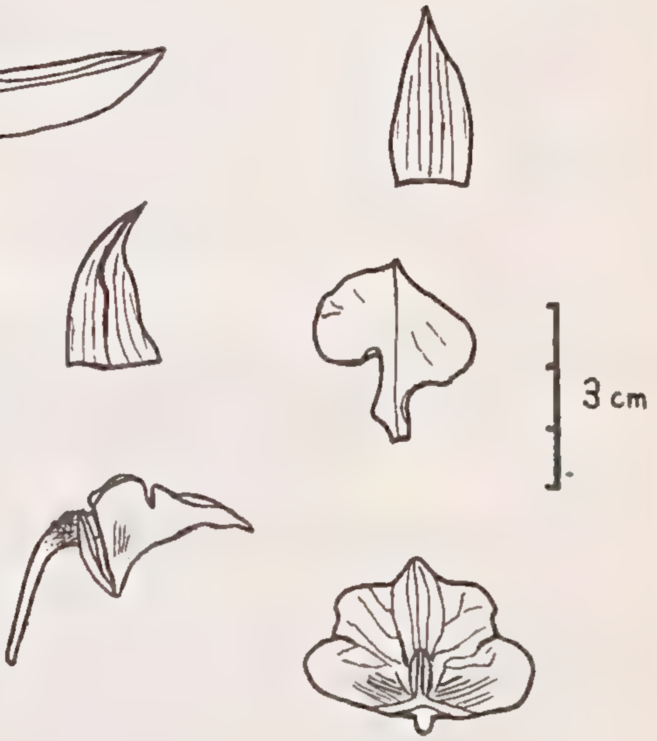
Illustration:

Dendrobium forbesii Ridl. drawn from living material collected at Efogi.

Laiagam, Enga Province,
February, 1981 **Papua New Guinea**

Dendrobium forbesii Ridl.





Drawing: T.M. Reeve

ACRIOPSIS JAVANICA Reinw. — Its Potential in Cultivation

by Peter Vaughan

Poorly known in Australia, very uncommon at orchid displays, but one of the simplest tropical orchids to cultivate, *Acriopsis javanica* is deserving of much wider recognition and cultivation.

Found from Tenasserim, at the base of the Himalaya Range, throughout South-East Asia to north Queensland, this is the most widely distributed *Acriopsis* species. In common with many other widespread species the form and colour of the flowers are quite variable. The Australian plants belong to the variety *nelsoniana* which extends to New Guinea where it overlaps in distribution with variety *javanica.*

The numerous small floweres are progressively presented on an arching inflorescence well clear of the leaves. Variety *javanica* has an inflorescence that may be either unbranched, or with one or two side-branches. Variety *nelsoniana* branches much more frequently, sometimes having over 200 flowers on the one inflorescence. This variety also has five white or white and yellow flowers whilst variety *javanica* has purple markings on the segments. The extent of the purple markings varies from spot near the tip of each segment to a well defined median line on each sepal, petal and labellum lobe. In flower form the two varieties appear to be very similar and I would be interested to learn of any distinguishing features. Hard and fast rules would be difficult to apply to such a variable species.

Apart from the labellum, used to differentiate species, the flower form of the *Acriopsis* genus is remarkably uniform though quite complex. The lateral sepals are fused, a rare characteristic shared with the *Cypripedium* tribe. This gives 2 petals and 2 sepals producing a cruciform (cross) shape.

Whilst most orchids guide the pollinator along the desired entry path with labellum appendages such as calli, commonly seen in *Caladenia,* or side lobes as in many *Dendrobium* species, *Acriopsis* species possess column arms to serve the same function. The high pollination success rate in nature proves this to be a successful adaption. Above the column arms is the large beak-like rostellum. Proportionally this must be one of the largest rostellums amongst orchids. The column tip is enclosed in a hood which would also serve to guide the pollinator. The lure employed by the flower is nectar, the nectary being formed by the joining of the labellum base to the basal half of the column producing a tube 2mm long. A spur protrudes from the back wall into the tube similar to the spurs found in many of the *Sarcanthinae.* This probably aids pollination, possibly making it more difficult for the pollinator to extract the nectar and so forcing the pollinator to enter the flower sufficiently to ensure pollen removal.

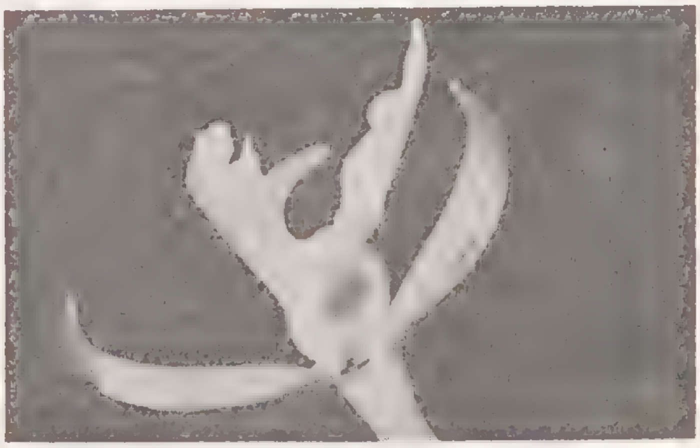
The distribution in Australia of *A. javanica* is from north Queensland south to the Daintree River. This species favours growing on the trunks of trees growing under light cover. In areas subject to dry periods hosts with moisture retentive barks are chosen. Consequently paperbarks are favoured in Australia. Similarly the riversides and estuaries are the preferred habitat in Australia but elsewhere rubber trees and coconut palms are frequently utilised. In the estuary of the Daintree River it is found along with *Luisia teretifolia, Dendrobium smillieae, D. nindii, D. discolor,* Australia's *Ephemerantha* species and finally *Crocodilus porosus*! Although the last mentioned species is the salt-water form it will not hesitate to spend some time in fresh water to obtain a good feed, so orchidists in the entire area should proceed with caution and a big boat.

In nature the orchid grows on the vertical trunk of many trees, producing all the compost it requires from its own roots.

Acriopsis species are peculiar amongst orchids by producing two types of roots. They produce the normal thick roots which penetrate into cracks in the host in search of moisture. Branching off these are different roots which are short, branch separately, and grow upward and away from the host. These can cover the pseudobulbs and aid by storing moisture and so allowing the plants to grow in very exposed positions. This appears to be a very simple system by which the orchid produces its own compost. The shortcoming is the lack of input of outside material that supplies nutrients required by the plant for growth. Ants have provided the answer to this problem as most *Acriopsis* plants, indeed most species of *Acriopsis,* provide nests for colonies of ants which would supply more than ample nutrient material.

COMMENTARY ON PHOTOGRAPHS

Side view: — *Acriopsis javanica* var. *javanica:* This view shows the central raised ridges on the labellum whilst the junction of the labellum and column is only just visible. Above this junction we can see, in order, the column arms, the rostellum and the hood covering the column tip. Flower height — 1cm.



Front view: — *Acriopsis javanica* var. *javanica:* The labellum shape is well defined along with the central raised ridges. The fused lateral sepals, hidden behind the labellum, form a cross in combination with the other segments. Flower width — 1cm.

Cultivation:

In temperate Australia *A. javanica* requires a heated glasshouse with a position receiving plenty of light. The choice of hosts is of little importance but cork must be the most convenient. Flowering in Australia is from July to October but in the tropics large plants flower all year round.

As an individual showplant this species has excellent potential as the flowers are long lasting, are produced in large numbers and are presented very well. As part of a show display it is still invaluable as the plant can be placed well back, providing greenery, while the inflorescence is still held forward amongst the shorter orchids.

The Australian Orchid Foundation has good supplies of *A. javanica* var. *javanica* seed. It is up to someone to provide *A. javanica* var. *nelsoniana* seed and then for an interested group of individuals to grow these to allow them the position they deserve as horticultural subjects.

4 Jalan Bunga Pudak,
Hillside, Tanjong Bungah,
Penang, Malaysia

November, 1980

10TH WORLD ORCHID CONFERENCE DURBAN — SOUTH AFRICA

In September of this year, Australian Native Orchids will be exhibited under the A.N.O.S. banner in Durban, South Africa. A small display will be mounted by two members of A.N.O.S. with the South African 10th World Orchid Conference Working Committee lending foliage plants and labour. It is rare for a World Conference to coincide with the spring flowering of our native orchids.

You will recall (from *The Orchadian* December, 1979) that our colleagues in South Australia, who are members of N.O.S.S.A., arranged for tubers of our terrestrial orchids to be sent to South Africa. These were to be grown as an experiment preliminary to a fully mounted top class Australian Native Orchid Exhibit in 1981. These tubers were received and distributed to interested growers in South Africa. *The Orchadian,* in June, 1980, suggested that members of A.N.O.S. in the eastern states should look to supplying the epiphytes to complement the exhibit. To our knowledge only one member took up the challenge in the eastern states. Nevertheless, both terrestrials and epiphytes are now growing on in South Africa.

Thanks must go to Mr Jim Holmes of Stellenbosch, South Africa, for his feedback on the orchids sent to him. Jim's enthusiasm, support, and continued willingness to assist wherever possible have made the effort worthwhile. It is a pity that closer liaison from other South African growers did not eventuate. Perhaps when our two members (Jim Simmons of N.O.S.S.A. and Erhard Husted of A.N.O.S. Council, N.S.W.) arrive in Durban, our other South African colleagues may come to the party with their contributions of plants.

A full report on this Australian endeavour will appear in *The Orchadian,* December 1981 issue.

Meanwhile we offer Erhard and Jim our best wishes for the Conference and trust that the other A.N.O.S. members who will be attending will find time to lend a hand with setting up the display. The plants, of course, are already there. So why not get in touch before you leave for Durban ? — J.J. BETTS

AUSTRALIAN NATIVE ORCHID SEMINAR

When: Sunday 9th August, 1981,
9 a.m. to 8 p.m.
Where: Melrose Hall, Great Western Highway,
Emu Plains.

Programme:

1. Native Species and their distribution.
2. Dendrobium Species and Hybrids.
3. Den. Selective Line Breeding.
4. Judging.
5. Housing.
6. Other Genera.
7. Raising Seedlings from Flasks.
8. Pest and Fungi Control.
9. Terrestrials and Terrestrial Hybrids.
10. Sarcochilus and their Hybrids.

Top lecturers in their fields from N.S.W., South Australia and Queensland.
Trade displays and sales.
Child minding service (quite free).
Seminar cost all inclusive — Lunch, tea, morning and afternoon teas, supper and copy of proceedings:

Single $14, Double $20 (1 copy of proceedings)

Registrations close 30.6.81 or when maximum 200 registrations received.

Hon. Sec. Mr M. Wilde
Lot 4, Singlesridge Road,
Winmallee, N.S.W. 2777

A.N.O.S. ANNUAL GENERAL MEETING AND ELECTION FOR COUNCIL 1981-82

NOTICE is hereby given that the Annual General Meeting of the Australasian Native Orchid Society will be held on SATURDAY, 22ND AUGUST, 1981 at the Ryde School of Horticulture, 59 Parkes Street, West Ryde, AT 10 A.M.

Business of the meeting: —

1. President's report.
2. Adoption of Financial Statements and Auditor's Report thereon.
3. Election of Office Bearers.
4. Any other business that may be properly brought before the meeting.

Closing date for nominations of candidates for election to Council is Monday, 17th August, 1981 at 4 p.m.

The method of voting shall be by a show of hands and by signed proxy at the A.G.M. Proxies must be as prescribed in Section 53 of the Constitution and must reach the Secretary not less than 48 hours before the meeting.

By order of the Council, (Mrs) N. Martin
Assistant Secretary

CORRECT WRITING OF ORCHID NAMES (from the Australian Orchid Council's Nomenclature Committee)

Species and their variants:

Each species has a generic name, or first term, e.g. *Cattleya,* also a specific epithet, or second term, e.g. *skinneri.*

The two terms together constitute the specific name of the species: *Cattleya skinneri.*

When written they are always in italics or underlined. The generic name begins with a capital letter but the specific epithet (second term) is written with a small first letter even when derived from a personal name.

A varietal epithet (third term) is given to a distinctive race within a species, it is preceded by the abbreviation var. (for variety) in roman letters, and is in italics or underlined and without a capital. Example: *Cymbidium lowianum* var. *concolor.*

A special clone of a species may be given a cultivar epithet (third or fourth term). It is not latinised, has a capital, is not in italics and has single quotes. Examples: *Cattleya skinneri* 'Mistral' (third term) and *Cymbidium lowianum* var. *concolor* 'Picardy' (fourth term).

Artificial Hybrids:

The generic name (first term) begins with a capital and is in italics or underlined. The second term is always a registered hybrid name.

It is not latinised, is in roman letters, and the initial letter is a capital. Example: *Cymbidium* Highland Mist.

A special clone of a hybrid may be distinguished by a cultivar epithet. It is in roman letters, has a capital, and is in single quotes. All three terms constitute the cultivar name. Example: *Cymbidium* Highland Mist 'Dillabirra'.

General Points:

The word "species" is both singular and plural.

The word "genus" is singular and its plural is "genera".

Generic names are always one word and abbreviations must adhere to this. Thus Blc, Bc., Slc, etc. (Multi-generic names abbreviated for Brassolaelie cattleya etc.)

Note that "var." or "variety" is only used for species orchids and refers to a race, not a clone.

For more detailed data on correct usage refer to the International Orchid Commission Handbook on Orchid Nomenclature and Registration.

RECENT NAME CHANGES TO AUSTRALIAN ORCHIDS

by P.S. Lavarack

In his recently published paper "Orchid Genera in Thailand IX. *Flickingeria* Hawkes and *Epigenium* Gagnep." Seidenfaden (1980) makes some taxonomic observations which affect the commonly used names of two Australian Orchids. These are two Australian species of the genus *Ephemerantha.*

Both Hunt and Summerhayes, working in England, and Hawkes, working in America, realised almost simultaneously about 1960 that the existing generic name *Desmotrichum* Blume was invalid and a new one must be found. Hunt and Summerhayes proposed *Ephemerantha* but Hawkes had just previously proposed *Flickingeria.* The English authors claimed that Hawkes's name was not validly published, but Seidenfaden in reviewing the situation claims that ". . . Hunt and Summerhayes' opinion is, however, not correct and the generic name *Flickingeria* must stand".

The upshot of all this is that *Ephemerantha comata* (Bl.) Hunt and Summerhayes now becomes *Flickingeria comata* (Bl.) Hawkes and *E. convexa* (Bl.) Hunt and Summerhayes is now *F. convexa* (Bl.) Hawkes.

There appears no doubt that Seidenfaden is correct, but those who want to follow the argument further are referred to two references: Hunt and Summerhayes (1961) and Brummitt (1980).

Seidenfaden in a previous revision (1978) also made one other change of significance to Australia. In his work on the Neottioideae of Thailand he reduces *Nervilia discolor* (Bl.) Schltr to a synonym of *N. plicata* (Andr.) Schltr. This species as it is now recognized has a very wide range from India to Australia.

Another nomenclatural change affecting Australia was mentioned by Womersley (1980) in a recent review in *The Orchadian.* This was the "lumping" of *Cadetia* with *Dendrobium* by van Royen (1979). This is a matter of taxonomic judgment and most recent workers have preferred to keep the genera separate. I remain unconvinced that they should be united and will be maintaining *Cadetia* as a separate genus.

The final change concerns *Bulbophyllum leratii* (Schlechter) J.J. Smith. Halle (1977) in his detailed study of the orchids of New Caledonia came to the conclusion that *B. leratii* should be considered a synonym of *B. gracillimum* (Rolfe) Rolfe. Since Halle is well placed to have seen a range of both species I am inclined to accept his conclusions.

In summary the following name changes should be made (author citations in the text): —

OLD NAME:	NEW NAME:
Ephemerantha comata	*Flickingeria comata*
E. convexa	*F. convexa*
Nervilia discolor	*N. plicata*
Bulbophyllum leratii	*B. gracillimum*

References:

Brummitt, R.K. 1980: Questions of effective publication. Taxon *29*: 477-483.

Halle, N. 1977: Flore de la Nouvelle Caledonie et Dependances. 8. Orchidacees. Museum National d' Histoire Naturelle.

Hawkes, A.D. 1961: *Flickingeria,* a new genus of orchids. The Orchid Weekly *2* (46): 451-460.

Hunt, P.F. and Summerhayes, V.S. 1961: Notes on Asiatic Orchids 3. Taxon *10* (4): 101-110.

van Royen, P. 1979: The Alpine Flora of New Guinea Vol. 2. J. Cramer.

Seidenfaden, G. 1980: Orchid Genera in Thailand IX. *Flickingeria* Hawkes and *Epigeneium* Gagnep. Dansk. Bot. Arkiv. *34* (1): 1-104.

Seidenfaden, G. 1978: Orchid Genera in Thailand VI. Neottioideae Lindl. Dansk Bot. Arkiv *32* (2): 1-195.

Womersley, J.S. 1980: Book Review. *The Orchadian* *6* (10): 227-228.

National Parks & Wildlife Service,
Northern Regional Centre,
Marlow Street, Pallarenda,
Townsville, Qld. 4810

19/2/81

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THE GREAT PYRAMID APPEAL – Royal Botanic Gardens, Sydney

Glasshouses are a focal point of botanic gardens everywhere. This is particularly so at the Royal Botanic Gardens, Sydney, where the Tropical Glasshouse is a fascinating pyramidal structure of aluminium and glass with striking displays of tropical and subtropical plants.

With the support of the Premier of New South Wales, the Royal Botanic Gardens has launched an Appeal to build two more Pyramid Glasshouses. To help celebrate their 50th Anniversary, Apex have offered their support for this Community Project, hopefully to ensure the success of the Appeal.

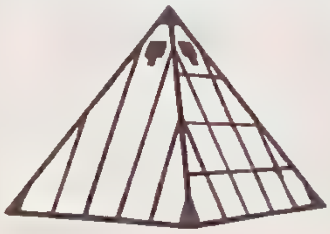
With this additional space it will be possible to provide separate displays of Australian tropical plants, tropical exotics, and ferns together with their allied plants. The Gardens already have almost enough plants in reserve to fill the proposed new glasshouses immediately, and to add to the scientific and educational reputation which the Gardens have established.

The Gardens will take advantage of the opportunity to upgrade the display collection, particularly of rare and endangered species. In the proposed design the existing glasshouse will become the first of a complex of three units. Access to the three pyramids will be underground, and each pyramid will be linked by underground corridors leading to a centralized foyer with space for educational displays and aquatic plants.

In this Year of the Disabled, special design considerations will allow for wheelchair access.

The money for this project is being sought from the general public as well as business houses and corporations. In conjunction with Apex, an Art Union is being run with prizes to see the pyramids of Egypt, Mexico and Thailand. Tickets are $2.00 each and will be on sale every weekend at the Gardens, or can be obtained by writing to: The Great Pyramid Appeal, Royal Botanic Gardens, Mrs Macquarie's Road, Sydney. Phone: (02) 27-4347. Donations may be deposited at any branch of the Rural Bank to account number 89021300, Bent and Bligh Street Branch; alternatively cheques may be forwarded to the address above.

The Royal Botanic Gardens are grateful for the support shown to date by Thai Airways in providing the return fares to Thailand, the Rural Bank for providing spending money, and each of the respective Government Tourist authorities of the three countries. They have agreed to play host to the Art Union winners with a "V.I.P." package of escort, itinerary and accommodation.



For any additional information don't hesitate to contact Ed Wilson at the Royal Botanic Gardens.

Who's Who

THE AUSTRALASIAN NATIVE ORCHID SOCIETY OFFICERS AND GROUP CONTACTS:

A.N.O.S. Council:

President: J.A. Walker; Vice-President: E. Gordon; Secretary: D. de Silva; Asst. Secretary: Nola Martin; Treasurer: E. Husted; Editor: J.J. Betts; Asst. Editor: P. Weston; Councillors: M. Harrison, F. Martin, F. Pierce, G. Wells.

A.N.O.S. Groups and those Affiliated Societies extensively interested in Native Orchids:

NEW SOUTH WALES

- *Sydney Group:* Tel.: (02) 53 5956
  Meets 8 p.m. 2nd Friday each month, Ryde School of Horticulture, 59 Parkes Street, West Ryde.
- *Warringah Group:* Tel.: (02) 99 2468
  Meets 8 p.m. 2nd Thursday, Stony Range Flora Reserve, Pittwater Road, Dee Why.
- *Newcastle Group:* Tel.: 48 9109 — Meets 4th Wednesday, John Young Community Hall, Thomas Street, Cardiff.
- *Wollongong & District:* Secretary: Mrs E. Beileiter, 19 London Street, Berkeley, 2506.
  Meets 2nd Tuesday at the Meeting Room of the Wollongong Town Hall.
- *Hastings Valley Group:* Tel.: (065) 85 6150 — Meets 7.30 p.m. 4th Friday at Uniting Church Hall, Wauchope.
- *Central Coast Group:* Tel.: Secretary (043) 88 1785
  Meets 7.30 p.m. 2nd Wednesday at the Baptist Church Hall, Cnr. York & Frederick Streets, East Gosford.
- *Far North Coast Group:* Tel.: 87 1036
  Meets 8 p.m. 3rd Thursday at Ballina Bowling Club, Cherry Street, Ballina.

VICTORIA

- *Victorian Group:* Tel.: (03) 754 6585
  Meets 8 p.m. 1st Friday at the National Herbarium, Royal Botanic Gardens, Melbourne.

QUEENSLAND

- *Darling Downs Group:* Secretary: Mrs J. Leyden, 66 Mort Street, Toowoomba, 4350. Tel.: (076) 34 2813.
  Meets 7.30 p.m. 3rd Friday at the Auditorium of the Technical & Further Education Centre, Old Empire Theatre, Neil Street, Toowoomba.
- *Native Orchid Society of Queensland (Affiliated): c/-* P.O. Box 159, Broadway, Qld. 4000.
  Meets 8 p.m. 1st Monday at Bread House, 49 Gregory Terrace, Brisbane.

SOUTH AUSTRALIA

- *Native Orchid Society of South Australia (Affiliated):* Secretary: E.R. Hargraeves, 1 Halmon Avenue, Everard Park, 5035 Tel.: (08) 293 2471 or 297 3724 — Meets 4th Tuesday, St.Matthew's Hall, 67 Bridge St., Kensington.

WESTERN AUSTRALIA

- *W.A. Native Orchid Study and Conservation Group (Inc.) (Affiliated):* Tel.: (09) 337 9614
  Meets 3rd Wednesday at the Department of Agriculture's Film Room, Jarrah Road, South Perth.

NORTHERN TERRITORY

- *The Orchid Society of the Northern Territory (Affiliated):* Secretary: Mrs G. Heinemann, Tel.: 85 4624, P.O. Box 38493, Winnellie, N.T. 5789

AFFILIATED SOCIETIES

Berowra & District Orchid Society
Blue Mountains & District Orchid Society
(Tel.: (047) 21 8126 — Mr K. Edwards)
Brisbane Orchid Society
Bundaberg Orchid Society
Cumberland Orchid Circle
Eastwood & District Orchid Circle
Gippsland Orchid Club
Hastings River Orchid Society
Illawarra & District Orchid Society
Ku-ring-gai Orchid Society
Mackay & District Orchid Society
Manawatu Orchid Society (New Zealand)
Manning River Orchid Society
Maroochydore Orchid Society
Maroondah Orchid Society (Victoria)
Maryborough & District Orchid Society
Newcastle Orchid Society
North Brisbane Orchid Society
Northern & Eastern District O.S. (South Australia)
Orchid Club of South Australia (Inc.)
Orchid Society of Papua New Guinea
Sutherland Shire Orchid Society
Tasmanian Orchid Society
Toowoomba Orchid Society
Tully & District Orchid Society
Tweed District Orchid Society

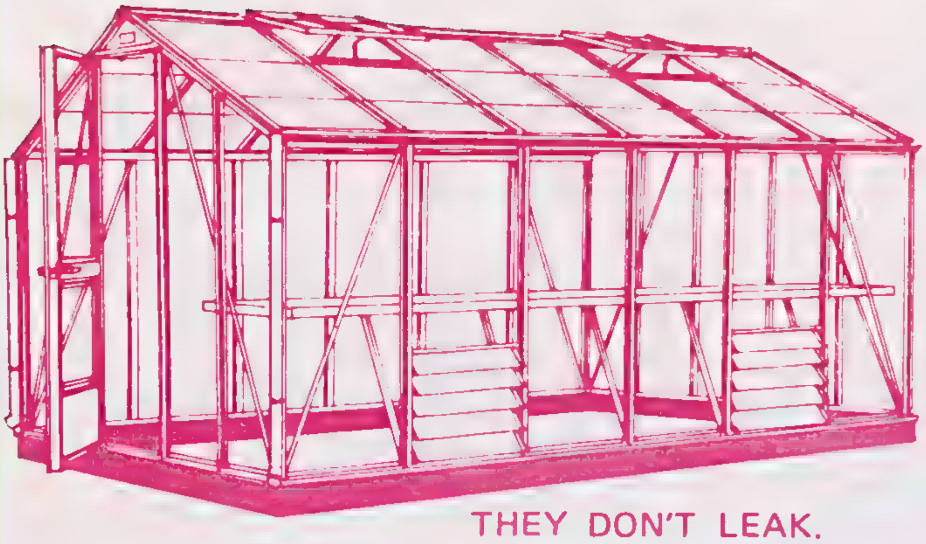
NEWLY REGISTERED AUSTRALIAN NATIVE ORCHID

The Orchid Review for June, 1981 has listed from the R.H.S. registrations of March, 1981 the following Australian hybrid: —

NAME	PARENTAGE	REGISTERED BY
Dendrobium Peach Glow	**Golden Fleck x Hastings**	**D.M. Cannon (Originator W. & G. Cannons)**

Brief details and a photograph of this cross were given in David Cannon's article "Native Dendrobium Hybridising" in *The Orchadian* for December, 1980 (Vol. 6, No. 10, p. 240).

BACO BUILDS BETTER GLASSHOUSES



THEY DON'T LEAK.

BACO has now produced its Delux model designed for summery weather. It's illustrated here (without shelf). How beautiful it is! Lots of ventilation, hinged door, strong, strong aluminium sections, special sealant, holding glass in a leak-proof comfortable embrace.

You buy the kit and glass cut to shape; it's put together like clockwork. Your daughter can glaze it, easy as lolly pops. Aluminium never rusts, so it's flowers forever.

Other models are available, less expensive, leak-proof and able to resist an English winter.

British Aluminium can certainly make glasshouses — so they should, they are the world's largest.

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Hybridisers of fine orchids.

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Mini-antelope Australian Hybrids from LONNE'S NURSERY

(Importers & Exporters)

An introductory offer of hybrids using the Australian native *Dendrobium canaliculatum:*

- *D. canaliculatum x D. X superbiens*
- *D. canaliculatum x D. antennatum*
- *D. canaliculatum x D. bigibbum v. compactum*
- D. Gold Flush *x D. canaliculatum*
- (*D. strebloceras x* D. Gold Flush) *x D. canaliculatum v. nigrescens*

One flowering size plant of each (bare root) incl. airmail postage for $45.00 (Aust.) **Plus bonus f.s. plant of** *D. canaliculatum v. nigrescens.*

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II *Subject Matter.*

III *Orchid Genera, Species and Hybrids.* (species and hybrid names are listed in alphabetical order under each genus).

IV *New Species Descriptions Published for the First Time in This Volume.*

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J.J. BETTS
Editor

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GENUS DENDROBIUM

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